# GVM6600-LCT

## Direct Driven Leaf Collector

**Owner's Manual**
**Safety Manual**
**Pre-Operating Manual**
**Operating Manual**
**Maintenance Manual**
**Service Manual**
**Parts Catalog**

**November 2013 edition**

GVM-VAC
800-632-7989
www.GVM-VAC.com

316011

# ⚠ CAUTION

# DO NOT ATTEMPT TO OPERATE OR REPAIR THE LEAF COLLECTOR WITHOUT FIRST READING AND UNDERSTANDING THIS MANUAL

IF YOU HAVE ANY QUESTIONS CONCERNING THE INSTALLATION OR OPERATION OF THIS UNIT, PLEASE CALL GVM-Vac FOR ASSISTANCE BEFORE ATTEMPTING TO REPAIR OR OPERATE THE UNIT.

# IMPROPER USE OF ANY MACHINE CAN RESULT IN SERIOUS INJURY!

# STUDY AND FOLLOW ALL SAFETY PRECAUTIONS BEFORE OPERATING OR REPAIRING UNIT

THIS MANUAL IS AN INTEGRAL PART OF THE LEAF COLLECTOR AND SHOULD BE KEPT WITH THE UNIT WHEN IT IS SOLD.

**GVM-Vac**
**www.gvm-vac.com**

**800-632-7989**

**⚠WARNING** **Read and understand this entire manual before operating, maintaining or repairing the leaf vacuum.**

**⚠ DANGER**

**DO NOT RIDE, SIT OR STAND ON UNIT.**

**RIDING ON UNIT COULD RESULT IN BODILY HARM OR FATAL INJURY USE EXTREME CAUTION WHEN UNIT IS IN USE, OR IN MOTION.**

If the decal above is missing or damaged call GVM-Vac immediately and we will send you a replacement free of charge. Never operate a unit with damaged or missing safety decals.

**⚠ DANGER** **DO NOT RIDE, SIT OR STAND ON UNIT**

**⚠ DANGER** **DO NOT MODIFY THE UNIT FOR RIDERS IN ANY WAY. SERIOUS INJURY OR DEATH MAY OCCUR**

GVM-Vac's leaf collectors are NEVER to be used to accomodate riders. If your unit has been modified to accomdate riders, remove these modifications immediately as this can result in serious injury or death.

GVM-Vac

800-632-7989
www.gvm-vac.com

# THANK YOU

Thank you and Congratulations on your puchase of your GVM-Vac Leaf Collector. Your GVM-Vac leaf collector has been carefully designed and manufactured to give you a maximum amount of dependability and years of trouble-free operation. Take comfort in the fact the GVM-Vac has been manufacturing municipal products since 1910 and takes pride in our product's quality and our customer service.

Please take the time to thoroughly read this manual, as well as the engine manual, in its entirety before operating, maintaining, servicing or repairing your leaf collector. Please thoroughly review and follow all the safety procedures located in this manual.

Whenever you need replacement parts, service information or any question regarding your GVM-Vac product please feel free to contact us at 800-632-7989 or www.GVM-Vac.com.

Please record the following information for future reference:

Model No.: _____

Serial No.: _____

Vin No: _____

Engine Serial No.: _____

Date of Purchase: _____

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# SAFETY PRECAUTIONS

**⚠WARNING** **Read and understand this entire manual before operating, maintaining or repairing the leaf vacuum.**

## 1.0 GENERAL SAFETY

1.1 Safety Symbol Definitions
1.2 Do's and Do Not's
1.3 Training
1.4 Safety Decals
1.5 VIN And Serial Number Locations

**⚠WARNING** **Read and understand this entire manual before operating, maintaining or repairing the leaf vacuum.**

**⚠ DANGER**

**DO NOT RIDE, SIT OR STAND ON UNIT.**

**RIDING ON UNIT COULD RESULT IN BODILY HARM OR FATAL INJURY USE EXTREME CAUTION WHEN UNIT IS IN USE, OR IN MOTION.**

If the decal above is missing or damaged call GVM-Vac immediately and we will send you a replacement free of charge. Never operate a unit with damaged or missing safety decals.

**⚠ DANGER** **DO NOT RIDE, SIT OR STAND ON UNIT**

**⚠ DANGER** **DO NOT MODIFY THE UNIT FOR RIDERS IN ANY WAY. SERIOUS INJURY OR DEATH MAY OCCUR**

GVM-Vac's leaf collectors are NEVER to be used to accomodate riders. If your unit has been modified to accomdate riders, remove these modifications immediately as this can result in serious injury or death.

# SAFETY PRECAUTIONS

**⚠WARNING** **Read and understand this entire manual before operating, maintaining or repairing the leaf vacuum.**

## 1.1 Safety Symbol Definitions

This manual provides the owners/operator with procedures for safe operation, maintenance and repair of your leaf collector. As with any machine, there are hazards associated with their operation. For this reason safety is emphasized throughout this manual. To highlight specific safety information the following safety definitions are provided to assist the reader.

The purpose of safety symbols are to attract your attention to possible dangers. The safety symbols, and their explanations, deserve your careful attention and understanding. The safety warnings do not by themselves eliminate any danger. The instructions or warnings they give are not substitutes for proper accident prevention measures.

| SYMBOL | MEANING |
|---|---|
| | **SAFETY ALERT SYMBOL:** Indicates danger, warning or caution. Attention is required in order to avoid serious personal injury. May be used in conjuction with other symbols or pictographs. |
| **⚠DANGER** | **Disregarding this safety warning <u>WILL</u> result in serious equipment damage, injury or possible death.** |
| **⚠WARNING** | **Disregarding this safety warning <u>CAN</u> result in serious equipment damage, injury or possible death.** |
| **⚠CAUTION** | **Disregarding this safety warning <u>MAY</u> result in minor or moderate injury or property damage.** |

**⚠WARNING**

**Read and understand this entire manual before operating, maintaining or repairing the leaf vacuum.**

## 1.2 Do's and Do Not's:

This section contains some general safety precautions to do and not to do. This is not an all inclusive list and and it is the responsibilty of the operator to have proper training and use common sense in work situations.

**⚠WARNING**

**DO NOT:**

1. **DO NOT** operate, maintain or repair this unit without having fully read and understood ALL the aspects of this manual.
2. **DO NOT** ride, sit or stand on unit at anytime.
3. **DO NOT** modify the leaf vacuum for any reasons to allow for riders.
4. **DO NOT** operate the unit in a state of disrepair.
5. **DO NOT** operate the unit with ANY guards or safety devices broken, missing, or inoperable.
6. **DO NOT** operate the unit without wearing proper safety equipment.
7. **DO NOT** operate this unit while under the influence of any alcohol or medication.
8. **DO NOT** operate this unit if you have a record of mental instability or dizziness which could result in injury to yourself or others.
9. **DO NOT** operate this unit if you are under 18 years of age.
10. **DO NOT** operate this unit without fully inspecting the unit for any damage or leakage.
11. **DO NOT** operate if the unit has any excessive vibration.
12. **DO NOT** operate unit with the inspection door limit switch damaged or missing.
13. **DO NOT** operate unit unless it is properly connected to a leaf collection box.
14. **DO NOT** operate unit unless it is properly attached to the tow vehicle.
15. **DO NOT** tow unit without using all the safety chains.
16. **DO NOT** tow unit with a damaged tongue.
17. **DO NOT** fill fuel tank with engine running. Allow engine to cool for 5 minutes before refueling.
18. **DO NOT** operate unit if fuel is spilled or with fuel cap off.
19. **DO NOT** smoke or weld near the unit.
20. **DO NOT** run engine in an enclosed area.
21. **DO NOT** place hands or feet near moving or rotating parts.
22. **DO NOT** operate engine with an accumulation of grass, leaves or other debris on the engine.

# SAFETY PRECAUTIONS

**⚠WARNING**

**Do Not, continued;**

23. **DO NOT** run engine with air cleaner removed.
24. **DO NOT** leave leaf machine unattended while in operation.
25. **DO NOT** park machine on steep grade or slope.
26. **DO NOT** vacuum a leaf pile without looking for foreign objects such as metal, glass, plastic or large pieces of wood.

**Do's:**

**⚠WARNING**

1. **DO** completely read and understand the owner's manual before operating, maintaining or repairing the leaf collector.
2. **DO** follow engine and PTO manufacturer operating and maintenance instructions.
3. **DO** check fuel lines and fittings frequently for cracks or leaks. Replace if necessary.
4. **DO** completely inspect the unit before leaving the service garage.
5. **DO** check the tow tongue each day for cracks.
6. **DO** inspect and be attentive to what is being vacuumed.
7. **DO** check the impeller, liners and blower housing for cracks or holes daily.
8. **DO** wear proper safety equipment as described in this manual.
9. **DO** watch for pedestrians, animals and other foreign material when vacuuming leaves.
10. **DO** replace any worn or missing safety stickers immediately.

## 1.3 Training:

**⚠WARNING**

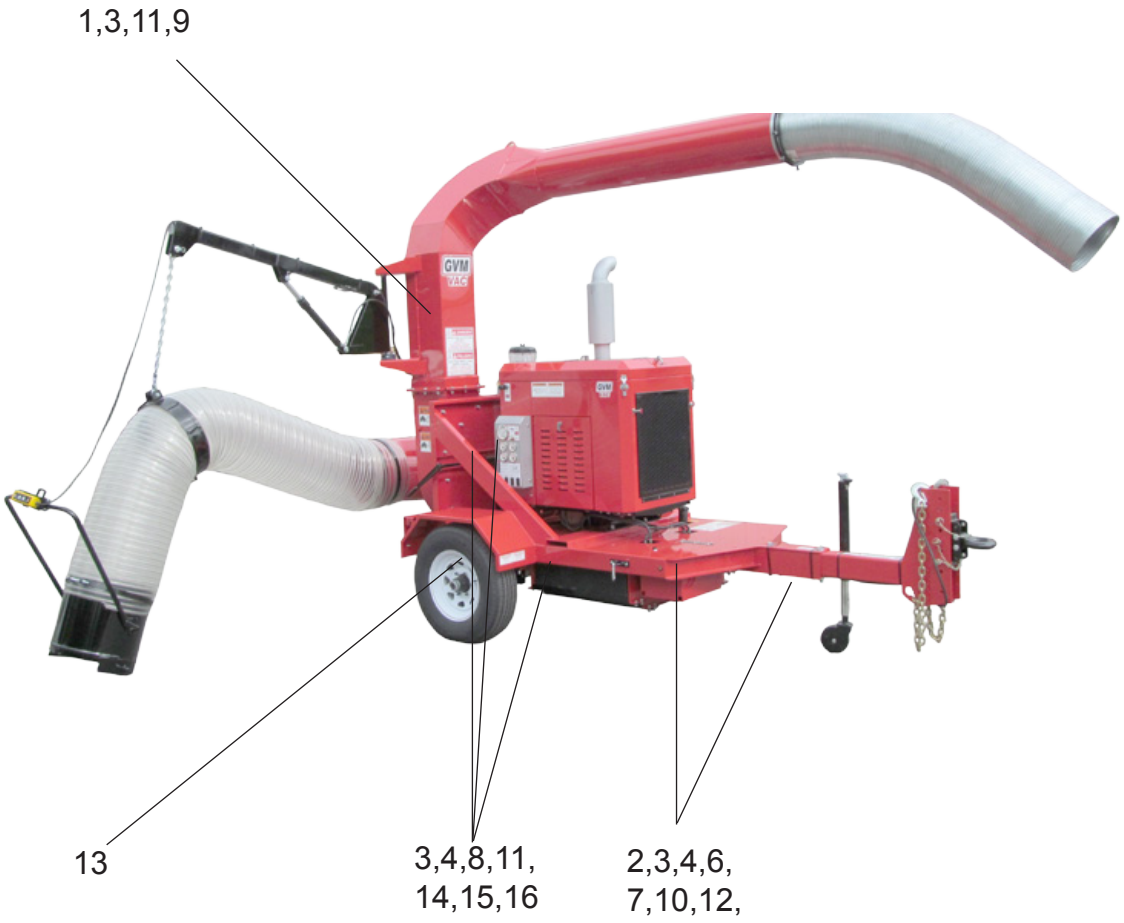
**Improper use of the ODB leaf collector CAN result in severe personal injury or death. All personnel using this leaf vacuum must be trained and qualified with all the operations, maintenance, repair and safety procedures defined in this manual.**

The warnings and procedures regarding safety in this manual are to be used as a guideline only. It is impossible to cover all the events that could happen in the vacuuming process. For this reason, it is vital that the owner accept the responsibility to implement a training program that will provide every operator or mechanic the basic skills and knowledge to make good judgement in all situations.

This training program must include the entire scope of hazards, precautions and government regulations encountered in the vacuuming process. The program should stress the need for regularly scheduled preventive maintenance and detailed equipment safety checks.

It is strongly recommended that all training programs be documented to ensure all operators and mechanics receive initial training on not just the operation but the safety features of the leaf collector.

## 1.4 Safety Decals




## Decals shown on next page

| ITEM NO. | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1. | 200182 | Danger--Do Not Open Cover While in Operation |
| 2. | 200179 | Danger--Do Not Ride, Sit or Stand on Unit |
| 3. | 200181 | Danger--Head, Eye and Ear Protection Required |
| 4. | | GVM Leaf Collector sticker |
| 5. | 200109 | Do Not Over-Lubricate bearings |
| 6. | 200055 | Use Diesel Only |
| 7. | 200177 | Danger--Flammable |
| 8. | 200059 | Do Not Engage PTO over 1,000 RPM |
| 9. | 200183 | Danger--Rotating Parts |
| 10. | 200178 | Danger--Explosion Hazard |
| 11. | 200189 | Danger--Check Impeller and Liners Daily for Wear |
| 12. | 200180 | Danger--Inspect Tow Bar for Damage |
| 13. | 200104 | Warning--Check Lug nuts |
| 14. | | GVM-Vac leaf collection systems sticker |
| 15. | 200120 | Throttle decal |
| 16. | 200112 | Safety Shut off-Ignition decal |

## 1.5 VIN And Serial Number Locations

figure 1.5a

**⚠WARNING**

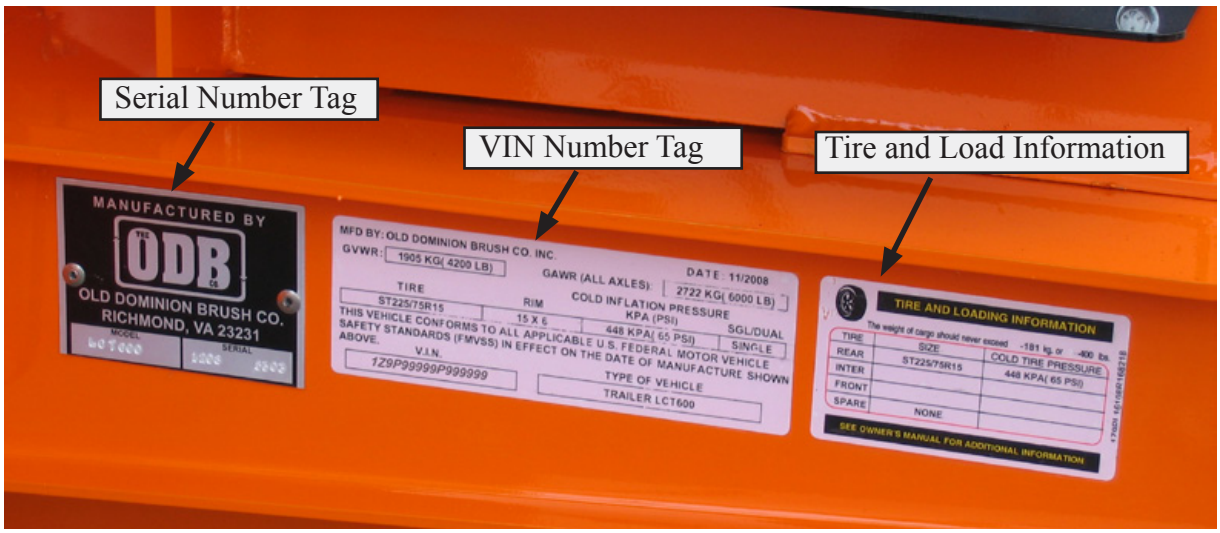
Thoroughly read and understand the safety and pre-operating sections of this manual before starting the engine.

**⚠WARNING**

Make sure each operator knows and understands the load ratings of the towed vehicle and that he/she is qualified to tow the vehicle.

The serial number tag and Vehicle Identification Number (VIN) sticker is located in front of the unit to the right of the the tongue. (See figure 1.5a).

The VIN sticker gives the user critical information regarding the trailer specfications such as Gross Vehicle Weight Rating (GVWR) which is the maximum allowable total weight of the fully loaded trailer, including liquids, cargo and the tongue weight of any towed vehicle, the GAWR or Gross Axle Weight Rating which is the maximum allowable weight the axles are designed to carry. The tire inflation pressure is also on the sticker.


Serial Number Tag
VIN Number Tag
Tire and Load Information
MANUFACTURED BY
ODB
OLD DOMINION BRUSH CO.
RICHMOND, VA 23231
MFD BY: OLD DOMINION BRUSH CO. INC.
GVWR: 1905 KG( 4200 LB)
GAWR (ALL AXLES): 2722 KG( 6000 LB)
DATE 11/2008
TIRE ST225/75R15
RIM 15 X 6
COLD INFLATION PRESSURE 448 KPA (65 PSI)
SGL/DUAL SINGLE
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS (FMVSS) IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
V.I.N. 1Z9P99999P999999
TYPE OF VEHICLE TRAILER LCT600
TIRE AND LOADING INFORMATION
The weight of cargo should never exceed -181 kg or -400 lbs.
TIRE SIZE COLD TIRE PRESSURE
REAR ST225/75R15 448 KPA( 65 PSI)
INTER
FRONT
SPARE NONE
SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION

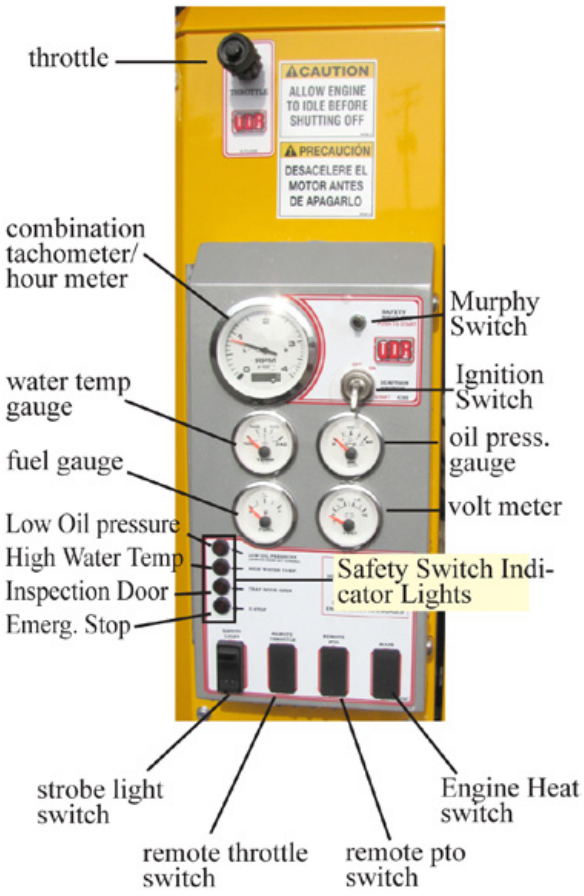
**⚠WARNING** **Read and understand this entire manual before operating, maintaining or repairing the leaf vacuum.**

## 2.0 PRE-OPERATING SECTION

2.1 Instrument and Controls
2.2 Safe Operations
2.3 Preparation For Operation
2.4 Pre-Transport Checks
2.5 Personal Protective Equipment and Clothing
2.6 Work Site Preparation

## 2.1 Instrument and Controls:

(Typical)




**⚠ CAUTION**

**Always make sure the PTO is disengaged before starting unit.**

Ignition Switch:
Used to power the accessories and start the unit. Unit will not start without Murphy switch depressed.
ACCESSORIES - first position
STARTER ENGAGE - second position (springs return to first position)

Murphy Switch:
This switch overrides the low oil pressure and high temperature cutoff control. This switch must be depressed before the starter engages. After the engine starts, wait for oil pressure to rise before releasing the button.

Throttle:
This control provides positive locking and vernier adjustment of engine.

Combination Tachometer / Hour Meter:
This gauge indicates the engine r.p.m's. The sender is located on the tachometer. The hour meter is digital and indicates the accumulated hours of the engine. This should be used to schedule maintenance.

Volt Meter:
The gauge shows the status of the engine charging system. When the charging system is operating properly it should read approximately 14 volts. If the gauge reads below 13 volts, the alternator is not charging the battery and the system should be checked by a qualified technicican.

Oil Pressure Gauge:
Confirms and indicates the presense and pressure of engine oil. If the gauge reads low, it should be checked by a qualified technician.

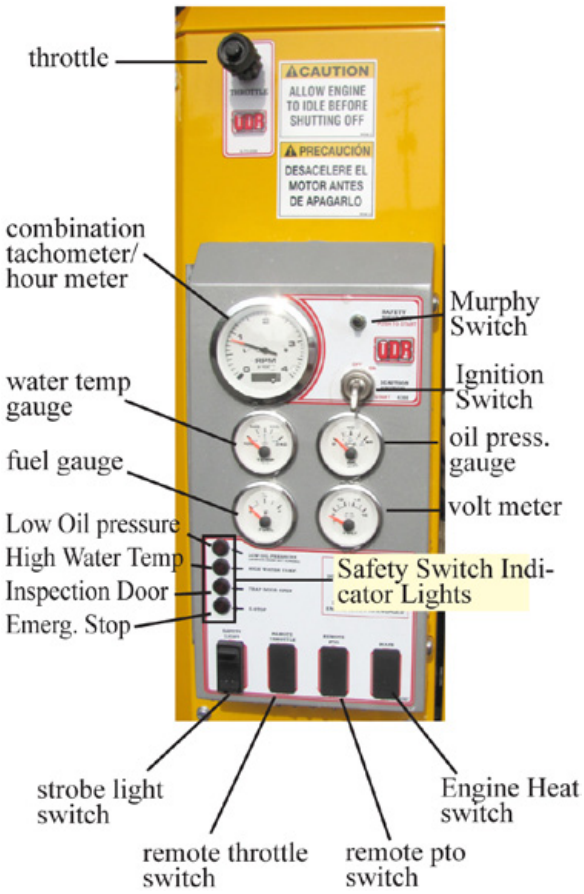
Engine Temperature:
Indicates the engine coolant temperature. If the gauge reads over 240 degrees the unit should be checked by a qualified technician.

Hour Meter:
Indicates the accumulated hours of the the engine. This should be used to schedule maintenance.

## 2.1 Instrument and Controls, cont.:

### SAFETY SWITCH INDICATOR LIGHTS

(Typical)




**⚠ CAUTION**

**Always make sure the PTO is disengaged before starting unit.**

These lights work with the Murphy (safety) shut off switch. When the light is on it indicates that the shut off switch has been tripped and the light indicates which device caused the trip.

Low Oil Pressure Indicator Light:
When lit the engine has reached a low oil pressure reading and has tripped (thus shut off the engine) the safety shut off (Muprhy) switch . This light will illuminate when the engine is first started until engine oil pressure has been established.

High Water Temperature Indicator Light:
Indicates the engine coolant temperature has reached 225 degrees and has tripped (thus shut off the engine) the safety shut off (Muprhy) switch.

Inspection Door Indicator Light:
Indicates that the limit switch located on the blower housing inspection door has been tripped (thus shut off the engine).

Emergency Stop Switch Indicator Light:
Indicates that the emergency stop switch (on the LCT650 only) has been depressed, tripping the safety switch and shutting off the engine.

### ROCKER SWITCHES

Strobe Light Switch:
Turns the strobe light on or off

Remote Throttle Switch (optional):
Increases or decreases the engine throttle. Pressing and holding the top of the switch increases the thottle. The longer the button is pressed the higher the throttle is advanced. Pressing the bottom of the switch decreases the throttle in the same manner as increasing the throttle.

Remote PTO Switch (optional):
Engages or disengages the PTO. Pressing the top of the switch engages the PTO while pressing the bottom of the switch disengages the PTO.

Engine Heat Switch (Cummins engines only):
Press the top of the switch for 20 – 30 seconds initiates the glow plug to aid in starting a cold engine.

## 2.2 Safe Operations:

**⚠WARNING**

**ALL personnel using, maintaining or servicing this unit must be trained in all safety procedures outlined in this manual. Improper or careless use of this equipment CAN result in personal injury or death.**

**Operations shall be restricted to:**

1. Properly trained, qualified and experienced operators and/or qualified and experienced maintenance and test personnel.

2. Trainees under the direct supervision of qualified and experience personnel.

3. Qualified and experienced maintenance and service personnel.

**Operators who qualify to operate this equipment under the above restrictions shall also comply with the following physical requirements:**

1. Have good vision and the ability to read and understand this manual as well as all safety and operational decals on the equipment.

2. Be capable of hearing, with or without a hearing aid, at a level needed to safely operate this equipment.

3. A record of mental stability with no history of epileptic seizures, dizziness, or any other disability that may result in injury to himself or others.

If any of these requirements are not satisfied at any time, the person failing to meet these requirements **MUST NOT OPERATE THIS EQUIPMENT.**

## 2.2 Safe Operations (continued):

**Additional Requirements:**

1. Each operator must demonstrate competence to understand all safety decals, operator's manuals, safety codes, applicable government regulations, and all other information applicable to the safe and proper operation of the leaf vacuum.

2. Each operator must demonstrate the ability to recognize an emergency situation that may arise during vacuuming operations and the knowledge and procedures to implement corrective action.

3. Each operator must demonstrate or provide evidence of qualificatation and experience prior to operating the leaf vacuum.

4. Each operator must be able to recognize existing or potential problems regarding the mechanical integrity of the leaf vacuum and report any maintenance requirements to the supervisor in charge.

5. Each operator must wear the proper personal clothing and safety gear. (Refer to SAFETY PRECAUTIONS Section 5.4)

6. Operators must not be physically or mentally fatigued.

7. Operators must not be under the direct or indirect influence of alcohol and/or drugs. This includes prescription drugs that could cause drowsiness, dizziness, or any other condition that would impair their ability to operate or use this equipment in a safe manner.

## 2.3 Preparation For Operation

**⚠ CAUTION**

**Before your leaf vacuum is put into operation it is very important to read and follow the procedures outlined in the engine owner's manual. (EOM).**

For specific information regarding the following checks please refer to the "Maintenance" section of this manual and the engine owner's manual.

**⚠ WARNING**

**DISENGAGE the clutch and remove the negative battery cable before performing the following checks.**

**⚠ WARNING**

**NEVER place any part of the body under or behind guards or any other area in which you cannot see.**

**IMPORTANT CHECKS:**

**NOTE:** The following checks contained in the next three sections should be performed prior to leaving the storage area.

1. Check engine fuel, coolant and oil levels. (see EOM)
2. Check engine air filter
3. Check all bolts and nuts to ensure they are tight.
4. Check all controls for free and proper operation.
5. Check main drive belt (if equipped) for proper adjustment.
6. Inspect the fan blades to ensure that they are not bent , deformed, fatiqued or cracked. Replace fan if any damage is present.
7. Inspect the intake hose flange to make sure it is connected correctly to the blower housing.
8. Inspect the leaf vacuum frame and structure for any bent, broken, cracked, missing or loose parts.
9. Check all guards to ensure they are undamaged, in place and properly secured.
10. All decals must be in place and legible prior to operating the leaf vacuum. See the decal section for decal replacement.

## 2.4 Pre-Transport Checks

**⚠WARNING**

**Failure to properly hitch the leaf vacuum to the tow vehicle, verify the road worthiness of the leaf vacuum and the tow vehicle and verify all equipment is properly stowed, may cause serious injury or death to yourself or others.**

**TOW VEHICLE MUST have proper towing capacity for the leaf vacuum being towed. Check the tow vehicles operating manual for rated capacity.**

**Do not tow the leaf vacuum unless all important checks listed below are completed.**

IMPORTANT CHECKS

1. Hitch is properly secured to tow vehicle and hose boom secured. Frame must be level or the tongue slightly lower than the rear of the leaf vacuum while towing to ensure proper weight distribution. The hitch may have to be adjusted when towing with vehicles of varying tow hitch height.

2. Safety chains installed correctly.

3. Chains routed under trailer tongue in an “X” pattern between tow vehicle and trailer.

4. Slack in chain should be adjusted to permit turning but should not be dragging on the ground.

5. Connect trailer wiring to the tow vehicle and ensure that all trailer lighting is operating properly.

6. Ensure that the safety breakaway switch is functioning properly and attached securely to the tow vehicle. Allow enough slack to ensure that vehicle turns will not activate the safety breakaway switch. **NOTE:** Follow manufacturers procedure to ensure tow vehicles brake control box is properly adjusted.

7. Check the general condition of the tires, tire pressure and ensure that all lug-nuts are securely fastened.

## 2.4 Pre-Transport Checks (continued):

8. Visual examination of the leaf vacuum frame, suspension and structure to determine if all components are correctly positioned and secured for travel.

9. Check the intake hose boom to verify that it is securely fastened to the leaf vacuum and can not swing free. (if equipped).

10. Verify there are no loose tools or materials on the trailer, inside the intake and exhaust hoses, or inside the engine sheet metal.

11. Check all cones, wheel-chocks, signs or other support tools and materials to ensure proper stowage.

## 2.5 Personal Protective Equipment and Clothing

**⚠WARNING**

**Always wear proper safety equipment as outlined below, not wearing such equipment CAN result in serious personal injury or possible death.**

**IMPORTANT CHECKS:**

Anyone operating the leaf vacuum equipment **MUST** wear appropriate protective equipment and clothing to protect them from injury during operations.

**PROTECTIVE EQUIPMENT:**

1. **Head Protection:** Hard hats without under-chin strapping.

2. **Eye Protection:** Wraparound goggle type eye protection held in place with an elastic band around the head or a hard hat mounted face shield, which provides full protection of the face.

3. Eye protection must meet ANSI Z87.1 standards.

4. **Hearing Protection:** plug type or “muff type” ear protection should be worn at all times while operating the unit.

5. **Breathing Protection:** Paper filter type dust masks should be worn to protect from dirt and dust particles during the vacuuming process.

6. **Reflective Vests:** Highly visible vests should be worn so motorists can see see the operator in all weather and lighting conditions.

7. **Work Gloves:** Gloves should be worn to protect the hands and wrists from debris.

8. **Steel Toed Boots:** should be worn to protect the feet.

**⚠DANGER**

**Work clothes MUST be close fitting, but not restrictive of movement, without any loose parts that could be entangled in any parts of the leaf vacuum. This includes items such as jewelry, chains and backpacks.**

## 2.6 Work Site Preparation

**⚠WARNING**

**Never place any part of the body under or behind guards or any other visually obscured area.**

**Making sure the leaves are clear of possible dangerous material is critical to safe vacuuming. Vacuuming up metal, glass, rocks or other dangerous material CAN cause serious damage to the equipment or personal injury.**

**The following guidelines must be followed to insure safety.**

1. An inspection of the leaves to be vacuumed must be done prior to the vacuuming process. We realize that it is impossible to completely inspect every inch of leaves being vacuumed, but it is imperative that all leaves be inpsected for obvious dangerous material before vacuuming.

2. The operator should never be in the line of traffic, the operator should work on the shoulder whenever possible.

3. The operators should place cones or other barriers to provide adequate warnings to vehicles and pedestrians that vacuuming is in progress.

4. Strobe lights on the leaf vacuum and on the tow vehicle should be on at all times for high visibility.

5. Confirm that all operators are wearing proper clothes and personal protective equipment.

6. Restrict all personnel, except the operator from the area near the leaf vacuum. **DO NOT** allow pedestrians, children or animals near the work area.

7. Make sure that the exhaust hose (if equipped) fits properly into the box container so that all debris is blown into the box container.

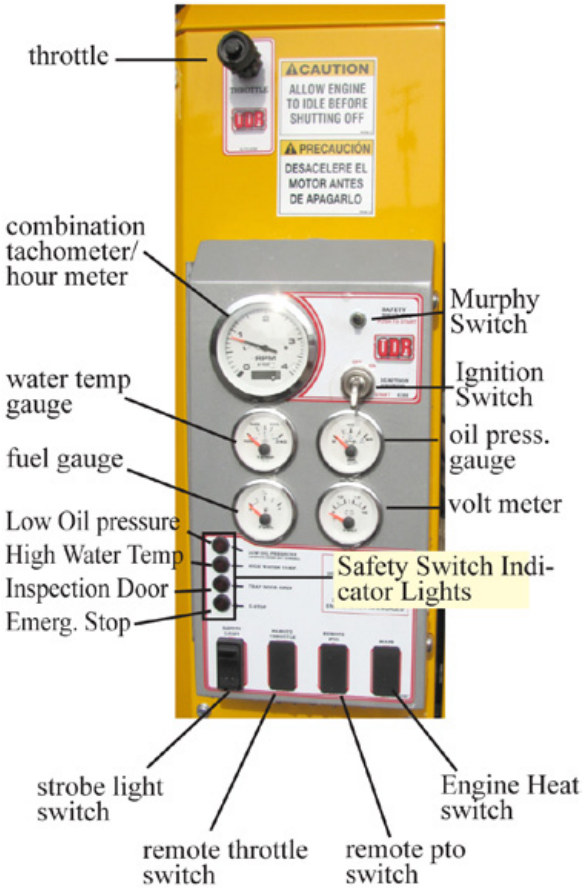
**⚠WARNING** **Read and understand this entire manual before operating, maintaining or repairing the leaf vacuum.**

## 3.0 OPERATING SECTION


3.1 Starting Engine
3.2 Engaging the PTO
3.3 Fluid Drive Coupler (if equipped)
3.4 Vacuuming Leaves

## 3.1 Starting Engine

figure 3a




**⚠ CAUTION**

**Always make sure the PTO is disengaged before starting unit. (See figure 3b)**

**⚠ WARNING**

**Thoroughly read and understand the safety and pre-operating sections of this manual before staring the engine.**

**⚠ CAUTION**

**DO NOT start the engine in an enclosed building. Proper ventilation is required before starting the engine.**

Review the Engine Operating Manual supplied with your leaf vacuum for specific start-up, maintenance and operating instructions. It is especially important to review break-in service procedures for brand new units.

figure 3b

**Starting Procedure (refer to figures 3a and 3b):**

1. Perform all the pre-starting, pre-operating checks outlined in the EOM and in this manual.

2. Make sure the PTO is disengaged as shown in figure 3b.

3. Turn the throttle control (fig. 3a) counter-clockwise 2 revolutions.

4. Depress and hold the Murphy switch while starting.

figure 3a

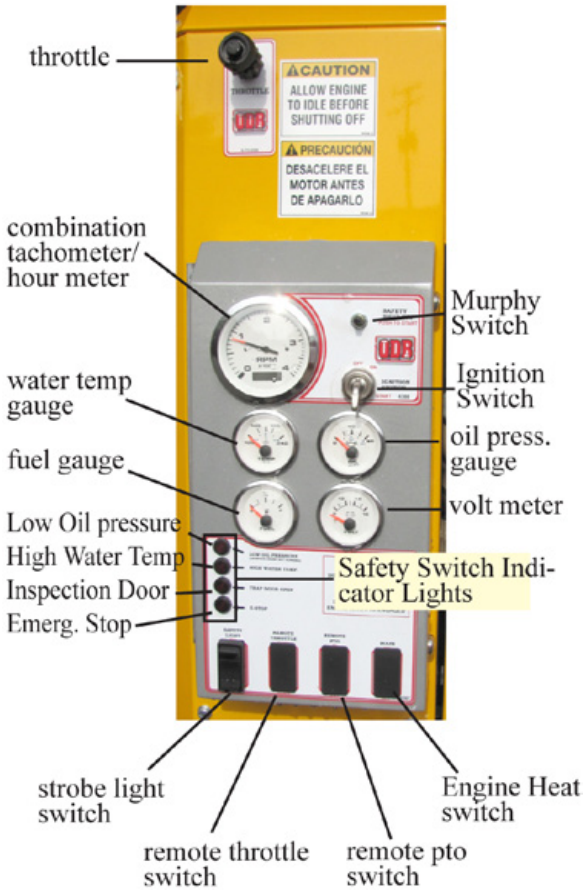



figure 3b

## 3.1 Starting Engine, continued;

5. **<u>IMPORTANT:</u> Do not operate the starter for more than 30 seconds at a time. To do so may overheat the starter. If the engine does not start the first time, wait at least 2 minutes before trying again. If the engine fails to start after 4 attempts, see the trouble shooting section of the EOM and this manual.**

6. Turn the ignition switch all the way to the right, when the engine starts release the ignition switch. It should spring back to the first position.

7. **<u>IMPORTANT:</u> If the ignition switch is released before the engine starts, wait until the starter and the engine stop turning before trying again. This will prevent possible damage to the starter and/or flywheel.**

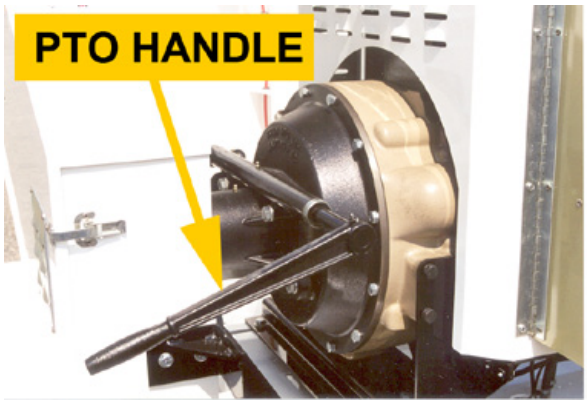
8. After the engine starts, continue to hold the Murphy Switch in until the oil pressure gauge reads at least 15 psi. The Murphy shut off switch will not allow the engine to operate below this level. If the gauge does not rise above 15 psi withing 5 seconds, stop the engine and determine the cause. Normal operating oil pressure is 50 psi with oil at normal operating temperature.

9. Check all gauges for normal engine opreration. If operation is not normal, stop the engine and determine the cause.

10. **<u>IMPORTANT:</u> To assure proper lubrication, operate the engine at or below 1200 rpm with no load for 1 -2 minutes. Extend this period 2 - 4 minutes when operating at temperatures below freezing.**

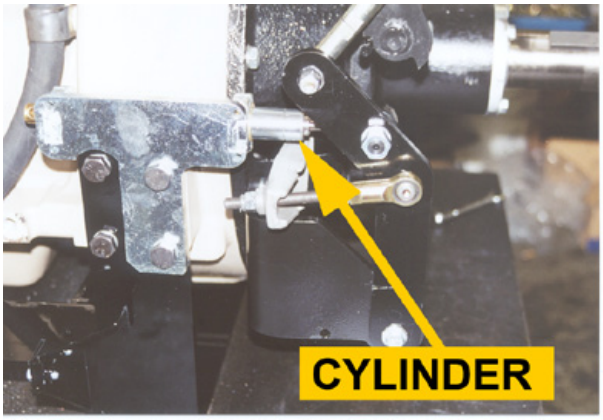
11. Watch the coolant temperature gauge. Do not place engine under load until it is properly warmed up. The normal engine coolant temperature range is 180 - 202 degrees F.

figure 3b




PTO shown disengaged

figure 3c




safety assist cylinder

figure 3d

PTO shown fully engaged

## 3.2 Engaging the PTO

**⚠WARNING**

**Thoroughly read and understand the safety and pre-operating sections of this manual before staring the engine.**

**⚠WARNING**

**Make sure the intake hose is properly attached and make sure the front of the hose is clear of any objects which could be inadvertently vacumed during the PTO engagement process.**

Review the Engine Operating Manual supplied with your leaf vacuum for specific start-up, maintenance and operating instructions. It is especially important to review break-in service procedures for brand new units.

**Engaging the PTO (refer to figures 3b, 3c and 3d):**

1. Perform all the pre-starting, pre-operating checks outlined in the EOM and in this manual.

2. Start the engine as previously discussed in this manual and in the EOM.

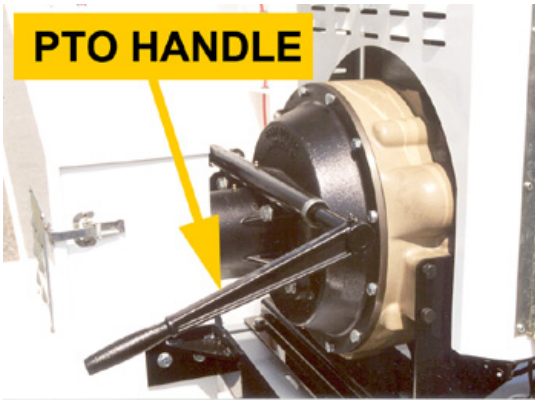
3. Once the engine has been allowed to thoroughly warm up (engine temperature gauge should read at least 180 degrees) pull the throttle control until the engine reaches 1000 rpm.

4. Grasp the PTO handle (fig. 3b) and slowly raise the handle. **NOTE:** Some units have a PTO assist cylinder which engages the PTO at a specific speed in order to properly engage the PTO. Because of this the PTO handle only needs to be raised slightly, then the assist cylinder will take over and engage the PTO automatically. (fig. 3c)

figure 3d

PTO shown fully engaged

figure 3b




## 3.2 Engaging the PTO, continued;

5. **<u>MPORTANT:</u> If the unit experiences any heavy vibrations or makes any unusual noises, shut the engine down and after following the necessary safety guidelines, have a qualified technician investigage the cause. DO NOT operate a unit that is in a state of disrepair.**

6. If the unit is running smoothly and does not dispaly any excessive vibration, the unit is ready to vacuum leaves. **<u>NOTE:</u>** Please see the next section before vacuuimg leaves.

**<u>Disengaging the PTO (refer to figures 3b and 3d):</u>**

1. Decrease the rpm to 1000 rpm.

2. Grasp the PTO handle and slowly disengage the PTO.

3. When the PTO is fully disengaged, the engine can be shut down.

## 3.3 Fluid Drive Coupler (if equipped)

Figure 3.3A

**⚠ WARNING**

**Thoroughly read and understand the safety and pre-operating sections of this manual before staring the engine.**

**⚠ WARNING**

**Make sure the intake hose is properly attached and make sure the front of the hose is clear of any objects which could be inadvertently vacuumed at any time.**

There is no PTO engagement when the unit is equipped with a Fluid Drive Coupler. The impeller is ALWAYS engaged and rotating.

**⚠ WARNING**

**The suction impeller is ALWAYS rotating when the engine is running and for a few minutes after the engine is shut off. Exercise caution whenever the unit is running.**

**⚠ CAUTION**

**IMPORTANT: If the unit experiences any heavy vibrations or makes any unusual noises, shut the engine down and after following the necessary safety guidelines, have a qualified technician investigate the cause. DO NOT operate a unit that is in a state of disrepair.**

## 3.4 Vacuuming Leaves

**⚠WARNING**

**Thoroughly read and understand the safety, pre-operating and operating sections of this manual before vacuuming. Wear the proper safety equipment as outlined in this manual.**

**⚠WARNING**

**Make sure the exhaust hose is connected to the box container properly before vacuuming leaves. Visually inspect the leaves before vacuuming for any material that could be harmful to the leaf vacuum or people. This includes bottles, wood, steel, glass, stone or other hard or breakable objects.**

**Vacuuming Leaves:**

1. Start the engine and engage the PTO using the procedures stated earlier in this manual.

2. Set the engine throttle to around 1400 rpm.

3. NOTE: Always vacuum leaves using the lowest rpm as possible. This saves fuel and decreases the amount of dust escaping the box container.

4. Lower the intake hose to a few inches above the leaf pile. Hold the intake nozzle at a 45 degree angle to allow proper air flow. This should allow the leaves to be vacuumed. DO NOT bury the intake nozzle into the leaf pile, this will cut off the air flow and will make vacuuming much more difficult and increase the chance of clogging.

5. If the leaves are not vacuuming, increase the rpm to 1400 and try vacuuming at this setting.

6. NOTE: Wet leaves will need higher rpm's to vacuum whereas dry leaves will only need minimal rpm's.

7. Continue moving the nozzle in a sweeping motion above the leaves while vacuuming.

**Read and understand this entire manual before operating, maintaining or repairing the leaf vacuum.**

# 4.0 MAINTENANCE SECTION


4.1 Maintence Overview
4.2 Maintenance and Lubrication
4.3 Lubrication
4.4 Preventative Maintenance
4.5 Torque Values

# Maintenance Section

## 4.1 Maintence Overview:

**⚠ CAUTION**

**Only properly trained personnel should perform maintenance or repair on this equipment. Consult GVM-Vac before performing any maintenance procedures that is not specificially covered in this manual. Improper maintenance or repair may void any and all warranties on this equipment.**

**⚠ WARNING**

**Improper maintenance or repair CAN result in equipment damage and/or personal injuries.**

**⚠ DANGER**

**BEFORE CONTINUING, please read and understand the Safety, Pre-operating and Operating sections of this manual before doing any prodcedures in this section.**

A properly maintained leaf vacuum will dramatically extend the life of the unit and will create a safer work place as well. For the general safety and welfare of all personnel it is important to create a scheduled maintenance program that covers all the elements in this manual as well as the engine, PTO and axle owner's manuals provided with this unit.

Use the chart on the following page as a guide for your scheduled maintenance program. If there are any questions concerning any ot these procedures please call GVM-Vac.

## 4.2 Maintenance and Lubrication

This chart is only a reference, always consult the Owners Manual of the Engine, PTO, axles, hoist, etc. for actual recommendations

**(Use Hour Meter as a Guide)**

| ITEM | DAILY/ 10 HOURS | 40 HOURS / WEEKLY | 80 HOURS / 2 WEEKS |
|---|---|---|---|
| Check Engine Oil Level | X | | |
| Check coolant level | X | | |
| Check Fuel Filter | X | | |
| Lubricate Main Shaft Bearings | X | | |
| Lubricate PTO Bearings | X | | |
| Check Air Filter | X | | |
| Check / Clean Pre-Filter | X | | |
| Check Lug Nuts and Tire Pressure | X | | |
| Inspect Radiator and Radiator Screen | X | | |
| Check Engine as described in Engine's Owner Manual | X | | |
| Inspect Blower Housing Exterior | X | | |
| Check Trailer Lights and Turn Signals | X | | |
| Check Power Band | X | | |
| Inspect Impeller Thoroughly for Damage | X | | |
| Check All Nuts and Bolts for Tightness | X | | |
| Check Tow Bar for Damage / Wear | X | | |
| Check Bolt Hole where Tongue Connects to Trailer | X | | |
| Clean and Inspect Battery and Connections | | X | |
| Inspect Intake and Exhaust Hoses for Wear | | X | |
| Inspect All Ducts for Damage | | X | |
| Remove Blower Face and Inspect Liners for Wear | | X | |
| Check PTO / Clutch Adjustment | | X | |
| Grease / Inspect Wheeel Bearings for Corrosion or Wear | | | X |
| Inspect all Hydraulic and Fuel Lines for Leaks or Wear | | | X |

## 4.3 Lubrication:

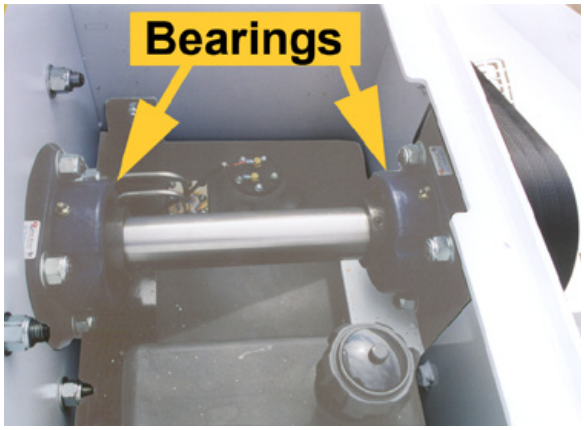
**⚠ CAUTION**

**Remove the negative battery terminal before attempting any lubrication procedures.**

**⚠ WARNING**

**Thoroughly read and understand the safety and pre-operating sections of this manual before performing any lubrication procedures.**

Figure 4.3A




The following are general lubrication procedures for our standard units. Any special or custom built units may have other lubrication procedures not directly mentioned in this manual. Please consult the factory or your dealer before any lubricating procedures not specifically mentioned in this manual.

Proper lubrication of your unit correlates directly to how long your unit will last. A properly maintained unit will last much longer than a unit that is not maintained properly. **NOTE:** Always lubricate bearings at the end of each work day. This will displace any moisture in the bearings. Also lubricate thorougly before extended shutdown or storage.

**Lubrication Points:**

1. **Drive Bearings (figure 4.3a):** These bearings are critical components of the belt-driven units. These bearings should be greased every 10 hours with approximately two strokes from the average hand pump grease gun. The type of grease used in these bearings are also critical to the performance of the bearings. A multi-purpose, heavy-load, high-temperature, moisture resistant #2 grease is required for the drive bearings. We recommend LubeMaster Premalube 4234 grease. Other premium quality grease that matches the above requirements may be used but after years of testing we recommends the Premalube grease.

**NOTE;** DO NOT mix different types of grease. The old grease MUST BE purged before a different type of grease is used. Mixing grease WILL cause premature failure to the bearings.

## 4.3 Lubrcation, continued;

2. **Trailer Wheel Bearings (figure 4.3b):** Most of the units are equipped with "EZ-Lube" grease fittings. This allows the operator to grease the bearings without removing the hubs. The "EZ-Lube" feature consists of axle spindles that have been specially drilled and fitted with a grease zerk in their ends (fig. 4.3c). When grease is pumped into the zerk, it is channelled to the inner bearing and then flows back to the outer bearing and eventually back out the grease cap hole. The trailer wheel bearings should be checked and greased after the first 30 days of service then at the beginning of every season.

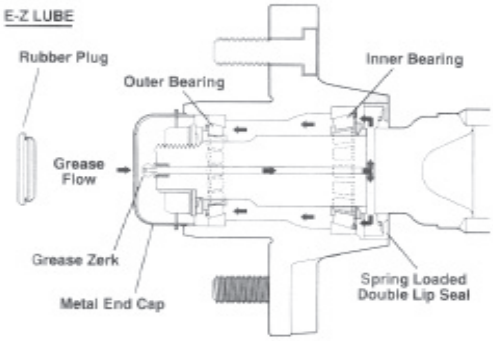
Figure 4.3b

Grease fitting is behind rubber plug

Grease specifications:

Thickener Point.....Lithium Complex
Dropping Point.....230 degr. C minimum
Consistency.....NLGI No.2
Additives.....EP,Corrosion & Oxidation Inhibitors
Base Oil.....Solvent refined Petroleum Oil
Base Oil Viscosity.....@40 deg. C 150cSt Min.
Viscosity Index.....80 Minimum
Pour Point.....-10 deg. Minimum

Figure 4.3c



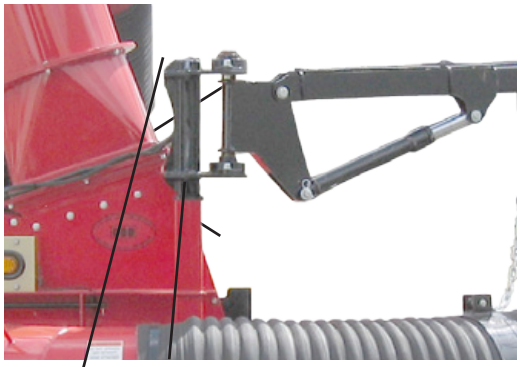

Approved Sources:

Mobil Oil.....Mobilgrease HP
Exxon/Standard.....Ronex MP
Kendall Refining.....Kendall L-427
Ashland Oil Co.....Valvoline Val-plex EP Grease.
Penzoil.....Premium Wheel Bearing Grease 707L

For any questions concerning wheel lubrication please consult the axle owner's manual supplied with your leaf collector or contact the manufacturer or dealer.

## 4.3 Lubrication, continued;

Figure 4.3d

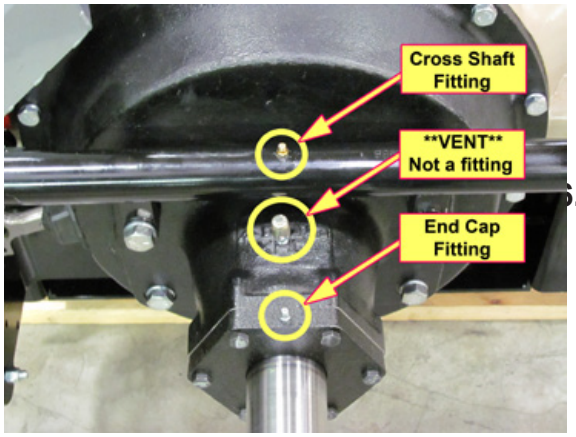


One fitting on each bearing

3. **Boom Swivel Bearings (figure 4.3d):** Grease the boom bearings once every week with a multi-purpose moisture resistant #2 grease.

4. **PTO Bearing & PTO Shaft Fitting (figure 4.3e):** The PTO bearings should be greased after every 50 hours of operation with a high grade, high temperature lithium base #2 lubricant having an operating temperature of 200 degrees F. Three to five pumps with a hand operated grease gun is sufficient. **NOTE:** Units manufactured after 2000 may not have a PTO bearing grease fitting. These bearings are sealed and do not require greasing. The PTO crossover shaft and linkage should be lubricated with high temperature lithium base #2 lubricant after 200 hours of operation.

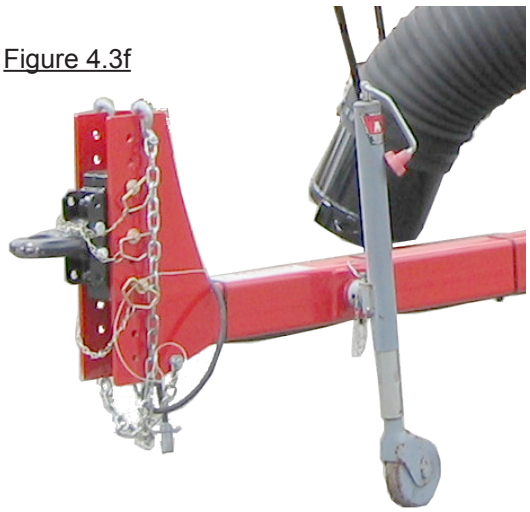
Figure 4.3e




5. **Hinge and Friction Points:** Leaf vacuum operation and longevity can be improved by keeping hinges and friction points lubricated. It is recommended that lubricaton be performed weekly. Use SAE30 weight oil on hinges and a premium grade, high temperature lithium based EP#2 grease on friction points.

6. **Hitch and Tongue (figure 4.3f):** The hitch and hitch ring should be checked and lubricated daily to minimize wear. Apply grease and/or SAE30 weight oil wherever applicable.

Figure 4.3f



## 4.4 Preventative Maintenance

**⚠ CAUTION** **Remove the negative battery terminal before attempting any maintenance procedures.**

**⚠ WARNING** **Thoroughly read and understand the safety and pre-operating sections of this manual before performing any maintenance procedures.**

The following are general preventative maintenance procedures for our standard units. Any special or custom built units may have other preventative maintenance procedures not directly mentioned in this manual. Please consult the manufacturer before doing any preventative maintenance procedures not specifically mentioned in this manual.

Proper preventative maintenance of your unit, just like lubrication, correlates directly to how long your unit will last. A properly maintained unit will last much longer than a unit that is not maintained properly.

**Preventative Maintenance:**

1. **Engine Oil:** Change the oil and oil filter according to schedules provided in your engine's owner's manual (EOM). The engine oil level should be checked every day. The level should be checked after the engine has been stopped for a period of time. This will allow the oil to drain back into the oil pan, allowing a better indication of the true oil level. If the level is low, see the engines owner's manual for the correct type of oil.
2. **Engine Coolant:** Check the coolant level before starting the unit each day. The coolant level should not be less than one inch below the top of the radiator.

**⚠ CAUTION** **NEVER check the engine coolant when the engine is hot. Allow the engine to cool at least one hour before checking the coolant. Check the engine owner's manual for instructions. ALWAYS wear eye and hand protection when working with the radiator.**

## 4.4 Preventative Maintenance, continued;

**Preventative Maintenance, continued;**

3. **Engine Radiator:** The engine radiator on a leaf vacuum becomes clogged with dust and debris frequently because of the nature of the job. If the radiator is not cleaned properly it WILL cause improper cooling and WILL eventually cause serious damage to your engine. The debris accumulating on the radiator can be lessened by lowering the RPM on the engine to a level just enough to vacuum the leaves. The higher the RPM the more dust that is put into the air. Also, it may be necessary to put mesh or tarps on the top of the leaf box container to reduce the debris and dust. If this is done, make sure there is enough air ventilation on the box so the box is not blown apart. Proper belt condition and coolant mix-ratio, as well as coolant conditioners, are all critical to proper engine cooling. See the engines owner's manual for specifics on coolant mixture ratios and conditioners. The radiator should be inspected and cleaned with compressed air everyday at the very least.

**⚠ DANGER**

**NEVER attempt to clean or inspect the radiator with the engine running or while the engine is HOT. Allow the engine to cool at least one hour before mantaining the radiator. Check the engine owner's manual for instructions. ALWAYS wear eye and hand protection when working with the radiator.**

4. **Engine Air Cleaner:** Due to the large amounts of dust generated in collection leaves, it is critical to your engine's life that the pre-cleaner and air filter be maintained properly. The pre-cleaner should be cleaned at least daily of any debris that has accumulated. If conditions warrant it should be cleaned more. The air filter should be checked daily and should be replaced at the first sign of it being dirty. DO NOT attempt to clean the air filter, replace the dirty air filter. It is a good idea to clean out the air filter housing once a week to clean any dust debris that may have accumulated
5. **Tires and Wheels:** Tires and wheel lug nuts should be checked on a daily basis. Tires should be checked for excessive wear and proper air pressure. Check the side wall of the tire for proper inflation pressure. Torque all 1/2" diameter lug nuts from 90 to 120 foot pounds. Torque all 5/8" diameter lug nuts from 175 to 225 foot pounds. Consult the axle manufacturers owner's manual for more detailed information.

## 4.4 Preventative Maintenance, continued;

**Preventative Maintenance, continued:**

6. **Trailer Brakes (if equipped):** The trailer's brakes should be checked daily, before leaving the equipment yard, for proper operation. The trailer brakes are designed to work in synchronization with your tow vehicles brakes. Never use your tow vehicle or trailer brakes alone to stop the combined load. The synchronization between the tow vehicle and the leaf vacuum is accomplished through the brake controller and needs to be set correctly. Please read the brake controllers manual and the axle owner's manual for these procedures.

**⚠WARNING** **DO NOT tow the leaf vacuum with damaged or non-operating brakes. Check the brakes daily for proper operation.**

The brakes should be adjusted after the first 200 miles of operation when the brake shoes and drums have "seated" and at 3,000 mile intervals, or as use and performance requires. The adjustment procedures are beyond the scope of this manual, please see the axle owners/service manual for specific instructions.

The trailer brakes should be inspected and serviced at yearly intervals or more often as use and performance requires. Magnets and shoes must be changed when they become worn or scored thereby preventing adequate vehicle braking. Again, see the axle owner's/service manual for specific procedures.

7. **FUEL TANK:** Fill the fuel tank at the beginning of the work shift leaving a gap of at the top of the tank for expansion of fuel. A full fuel tank will reduce the possibility of condensation forming in the tank and moisture entering the fuel lines. Check the fuel lines daily for cracks, holes or tightness.

## 4.4 Preventative Maintenance, continued;

**Preventative Maintenance, continued:**

**⚠ CAUTION** **ALWAYS wear eye and hand protection when working with the battery.**

8. **BATTERY:** The units are supplied with "maintenance free" batteries so there is no need to check fluid levels but the battery terminals should be checked daily for corrosion. Remove any corrosion with a wire brush and coat the terminals with light grease or petroleum jelly to reduce the possibility of corrosion. Also check the battery cable for wear all cable connections and battery tie downs to be certain that they are not loose.

**⚠ CAUTION** **Remove the negative battery cable before opening the belt guard.**

9. **DRIVE BELT (if equipped):** The main drive belt should be checked daily for cracks and for proper tension. If the belt shows any sign of cracking it should be replaced immediately. The proper tension of the belt should be approximately 1/2" deflection when applying a 8 pound pull.
10. **FASTENERS:** Fasteners should be checked weekly for the first 30 days and monthly thereafter. They must be in place at all times and properly torqued. For general torque values see the torque chart at the end of this section.
11. **INSTRUMENT PANEL AND CIRCUIT BOARD:** The instrument panel and circuit board should be cleaned with compressed air daily. Also the circuit board connectors should be wiped clean and have nonconductive grease applied weekly to help maintain solid connections.
12. **BOOM HYDRAULIC PUMP:** Check the fluid level daily. If fluid needs to be added, automatic transmission fluid (ATF) is recommended. Clean debris and oil off the solenoid and pump daily. A build up of debris can cause premature failure to the pump. Check and tighten all hydraulic fittings making sure there are no leaks.

## 4.5 Torque Values

| INCH BOLT AND CAP SCREW TORQUE VALUES | | | | | METRIC BOLT AND CAP SCREW TORQUE VALUES | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TYPE | SAE GRADE | | | | | CLASS | | | | | |
| | 5 | | 8 | | | 8.8 or 9.8 | | 10.9 | | 12.9 | |
| HEAD MARK | | | | | HEAD MARK | | | | | | |
| SIZE(D) | LB-FT | | LB-FT | | SIZE(D) | LB-FT | | LB-FT | | LB-FT | |
| | Lub* | Dry* | Lub* | Dry* | | Lub* | Dry* | Lub* | Dry* | Lub* | Dry* |
| 1/4" | 7 | 9 | 10 | 12.5 | M6 | 6.5 | 8.5 | 9.5 | 12 | 11.5 | 14.5 |
| 5/16" | 15 | 18 | 21 | 26 | M8 | 16 | 20 | 24 | 30 | 28 | 35 |
| 3/8" | 26 | 33 | 36 | 46 | M10 | 32 | 40 | 47 | 60 | 55 | 70 |
| 7/16" | 41 | 52 | 58 | 75 | M12 | 55 | 70 | 80 | 105 | 95 | 120 |
| 1/2" | 63 | 80 | 90 | 115 | M14 | 88 | 110 | 130 | 165 | 150 | 190 |
| 9/16" | 90 | 115 | 130 | 160 | M16 | 140 | 175 | 200 | 255 | 240 | 300 |
| 5/8" | 125 | 160 | 175 | 225 | M18 | 195 | 250 | 275 | 350 | 325 | 410 |
| 3/4" | 225 | 280 | 310 | 400 | M20 | 275 | 350 | 400 | 500 | 460 | 580 |
| 7/8" | 360 | 450 | 500 | 650 | M22 | 375 | 475 | 540 | 675 | 625 | 800 |
| 1" | 540 | 675 | 750 | 975 | M24 | 475 | 600 | 675 | 850 | 800 | 1000 |
| 1-1/8" | 675 | 850 | 1075 | 1350 | M27 | 700 | 875 | 1000 | 1250 | 1150 | 1500 |
| 1-1/4" | 950 | 1200 | 1500 | 1950 | M30 | 950 | 1200 | 1350 | 1700 | 1600 | 2000 |
| 1-3/8" | 1250 | 1550 | 2000 | 2550 | M33 | 1300 | 1650 | 1850 | 2350 | 2150 | 2750 |
| 1-1/2" | 1650 | 2100 | 2650 | 3350 | M36 | 1650 | 2100 | 2350 | 3000 | 2750 | 3500 |

***Lub** means coated with a lubricant such as engine oil, or fasteners with phospate or oil coatings. "Dry" means plain or zinc plated without any lubrication.

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Make sure fastener threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening. Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown inthe chart, applied to the nut, not the bolt head.

# ⚠ CAUTION

# DO NOT ATTEMPT TO OPERATE OR REPAIR THE LEAF COLLECTOR WITHOUT FIRST READING AND UNDERSTANDING THIS MANUAL

IF YOU HAVE ANY QUESTIONS CONCERNING THE INSTALLATION OR OPERATION OF THIS UNIT, PLEASE CALL GVM-Vac FOR ASSISTANCE BEFORE ATTEMPTING TO REPAIR OR OPERATE THE UNIT.

# IMPROPER USE OF ANY MACHINE CAN RESULT IN SERIOUS INJURY!

# STUDY AND FOLLOW ALL SAFETY PRECAUTIONS BEFORE OPERATING OR REPAIRING UNIT

THIS MANUAL IS AN INTEGRAL PART OF THE LEAF COLLECTOR AND SHOULD BE KEPT WITH THE UNIT WHEN IT IS SOLD.

**GVM-Vac**
**www.gvm-vac.com**

**800-632-7989**

# 5.0 SERVICE SECTION

## SERVICE AND TROUBLESHOOTING
## JOHN DEERE WIRING DIAGRAMS

**GVM-Vac**
**www.gvm-vac.com**
**800-632-7989**

# SERVICE AND TROUBLESHOOTING

5.1 Engine Electrical Troubleshooting Guide
5.2 Auto Mfg. Clutch Adjustment - 2008 and after
5.3 Hydraulic Boom Troubleshooting Guide
5.4 Impeller Installation and Removal
5.5 Belt Adjustment and Replacement Guide
5.6 Flange Bearing Installation and Removal
5.7 Impeller Installation and Removal
5.8 Replacing the Blower Housing Liners

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## 5.1 Engine Electrical Troubleshooting Guide

**ENGINE RUNS ONLY WHEN OVERRIDE BUTTON IS DE-PRESSED**

1. Make sure the PTO is disengaged.
2. Take a look at the limit switch located at the inspection door of the blower housing. Check to be sure that the inspection door closes completely and that the door presses in the limit switch. The limit switch is extremely sensitive and only needs to open 1/64" to shut the engine off.
3. If the inspection door closes properly and presses in the limit switch properly, then disconnect the two wires from the back of the limit switch.
4. Start the engine using the normal procedure then release the shut off button. If the engines continues to run then the problem lies in the limit switch or the limit switch wiring. If the engine still cuts off then the limit switch is not the cause, go to Testing the shut off switch.

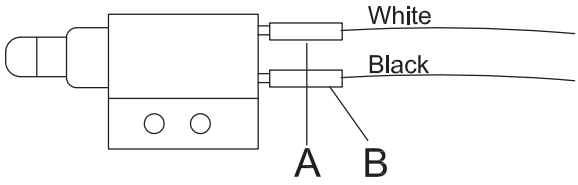
**TO TEST THE LIMIT SWITCH:**

5. With an ohm meter check the resistance of the terminals A & B (Fig. 1) while the button is not depressed. There should be no resistance or continuity. With the button depressed there should be full continuity or infinite resistance, if not the switch is bad and should be replaced.

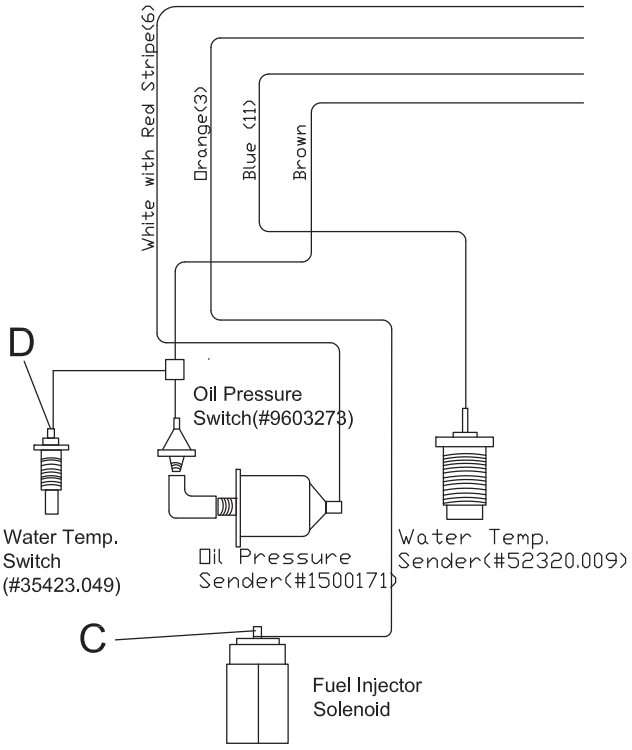
**TESTING THE SHUT OFF (MURPHY) SWITCH:**

6. Turn the ignition switch to the first position.
7. Put a test light to terminal B (Fig. 3) to test for current. If there is no current at B, power is not getting to the shut off switch. Then the problem is not the shut off switch.
8. If there is current at terminal B, put a test light on the fuse at location Z (Fig. 3). If there is no current there the fuse is blown. Replace fuse.
9. If there is current at B and Z, push the override button (letter X, Fig. 3) in on the shut off switch. While the button is depressed place the test light on terminal C (Fig. 3). If there is current at terminal C then the shut off switch is functioning properly and the problem lies elsewhere. If there is no current at terminal C then the shut off switch is defective and needs to be replaced.
10. Next locate the fuel solenoid valve located on the fuel injector pump (Letter C, Fig. 2). It has an orange wire running to it. Pull the ignition switch to the first position. Put a test light on the terminal of the fuel solenoid where the wire is attached. Test light should light up showing current, if not shut off switch is bad. Replace.
11. If engine still cuts off after shut off button is released then test the water temperature switch (located on the engine block, Letter D, fig. 2) by removing the brown wire attached to the temperature switch. Start the engine using the normal procedure then release the shut off button. If the engine continues to run then the water temperature switch is defective. Replace the switch. If the engine shuts off, do the same test on the oil pressure switch. If the engine continues to shut off after this test call ODB for additional service procedures.

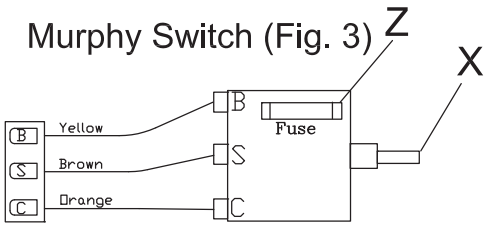
Limit Switch (Fig. 1)




Typical Wiring (Fig. 2)




Murphy Switch (Fig. 3)

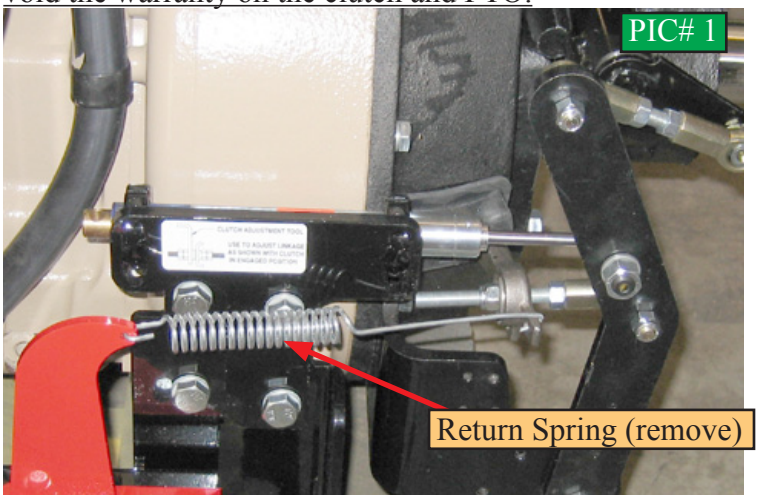


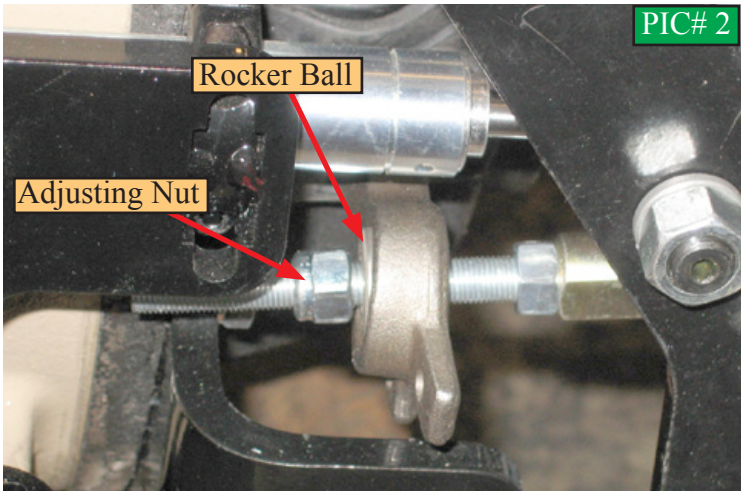
## 5.2 Auto Mfg. Clutch Adjustment - 2008 and after

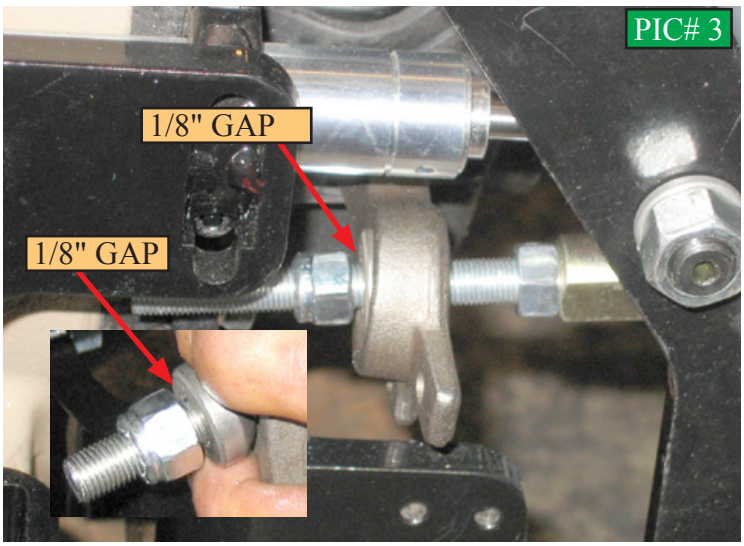
**⚠ CAUTION**

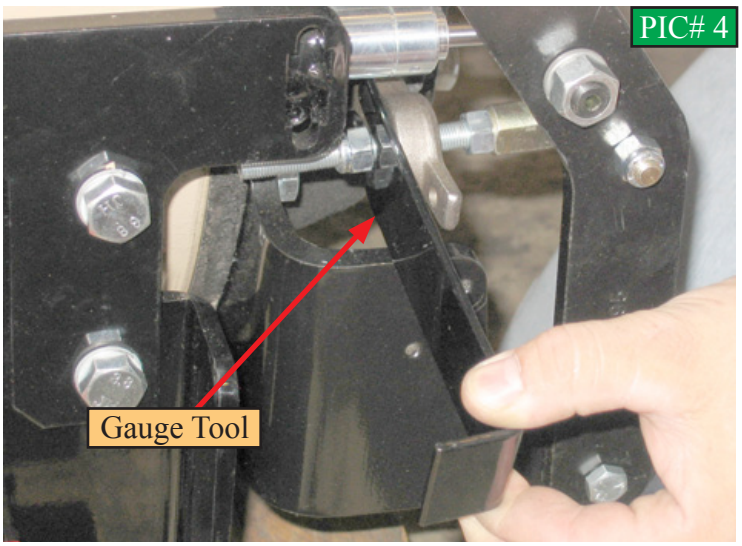
**Rotating Shafts, pulleys, and moving belts can cause severe injury or can be fatal. The engine and driven unit MUST be completely stopped before any adjustments or work is attemped to the engine, driven unit, or the PTO clutch itself.**

The clutch linkage should be checked after the first 15 hours of operation and every 40 hours there after. An improperly adjusted clutch can result in premature wear to the clutch disc, flywheel and the throwout bearing and will void the warranty on the clutch and PTO.



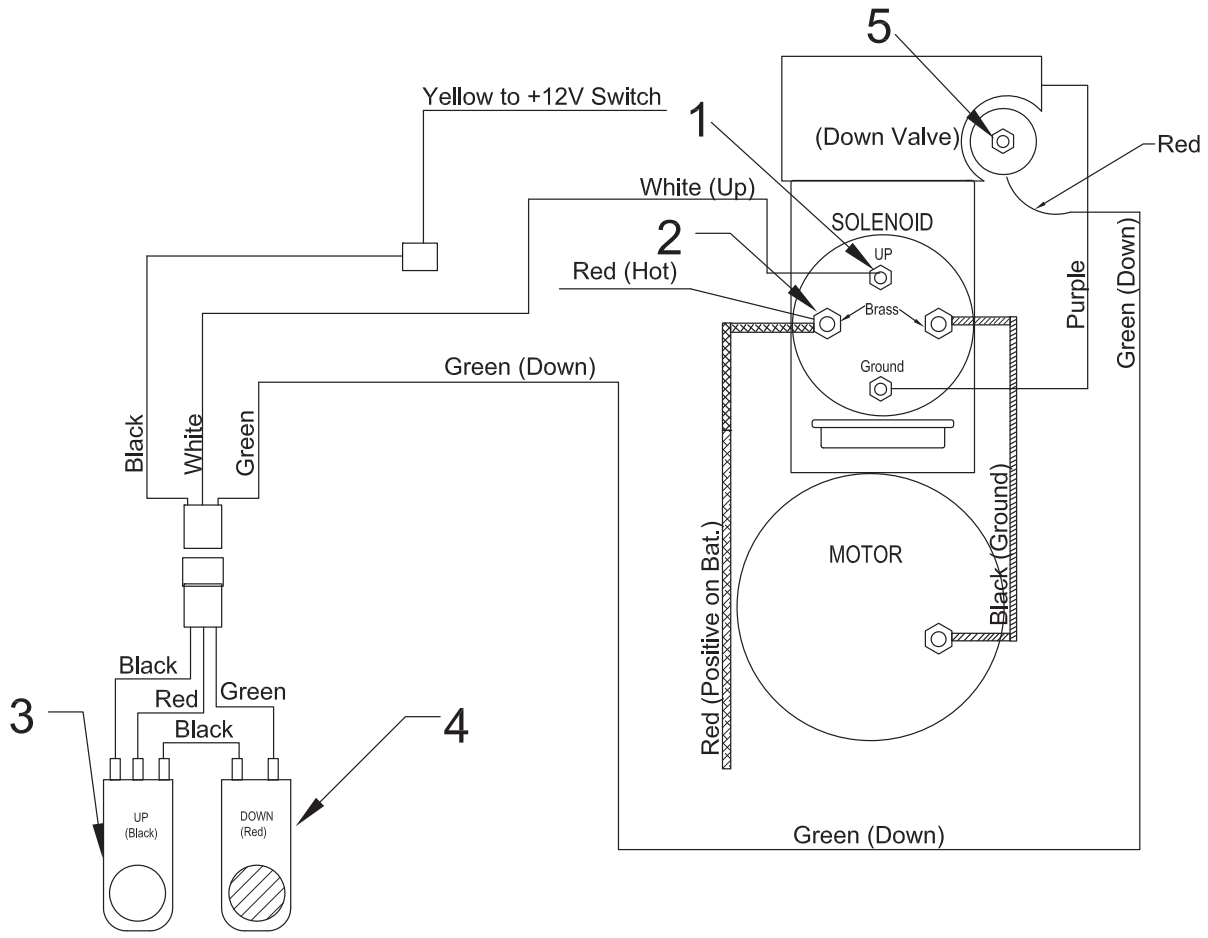




### ADJUSTMENT OF THE CLUTCH LINKAGE

1. Make sure the engine is OFF and remove the negative battery cable to ensure the unit can not accidently be started.
2. Remove the spring from the throwout arm. (See PIC# 1) An accurate measure of the arm tension CAN NOT be made with the spring attached.
3. With the clutch in the engaged position (the PTO is engaged when the PTO handle is pointing straight up on the LCT600 and LCT6000 and pointing out to the side (3 o'clock) on the LCT60C, LCT650 and SCL800TM) adjust the nut (See PIC# 2) against the "rocker ball" until a 1/8" gap between the nut and rocker ball is visible (See PIC# 3).
4. If available, use the special 1/8" gauge tool to slip between the nut and rocker ball. With the proper adjustment the gauge should slide between the nut and rocker ball with a slight amount of pressure. (See PIC# 4)
5. Move the adjustment nut to create the 1/8" gap.
6. Re-install the return spring.
7. Place the handle in the disengaged position. Check to make sure that the PTO output shaft turns freely.

## 5.3 Hydraulic Boom Troubleshooting Guide




**BOOM WILL NOT GO UP**

1. Check the fluid level in the reservoir.
2. Using a test light make sure there is current at the outside solenoid post (item#2), this has a 4 gauge Red battery cable attached. If no current is found check the battery condition and battery connections.
3. If there is current at this post, depress the "up" button (item# 3), while pressing the "up" button check for current at the middle post (item# 1), it has a White wire attached. If there is current at the post (item# 1) the solenoid may be defective. Run a jumper wire connecting #1 and #2. This will test the motor, bypassing the solenoid. If the boom raises, the motor is okay (motor part# MP-08004) but the solenoid is bad and needs to be replaced. Solenoid part number is MP-17744.
4. If there is NO current at the post (item# 1) check the wiring between the switch and the solenoid. If the wiring checks out okay, the switch is bad and needs to be replaced.

**BOOM WILL NOT GO DOWN**

1. Using a test light make sure there is current at the outside solenoid post (item#2), this has a 4 gauge Red battery cable attached. If no current is found check the battery condition and battery connections.
2. Press and hold the "down" button (item# 4), take a test light and probe through the insulation and test for current on the red wire at the valve (item #5).
3. If there is current, the valve is bad and need to be replaced. Valve part number is MP-19283.D. If there is NO current, check the wiring between the switch and valve, especially any connections. If the wiring checks out okay, the switch is bad and needs to be replaced.

## 5.4 Impeller Installation and Removal

**⚠ CAUTION**

Before removing the blower housing face remove the negative battery cable to ensure unit can not be started.

REMOVAL

1. The blower housing face must be removed to gain access to the impeller. Use an overhead crane or forklift to support the face while removing.
2. Once the face has been removed, remove the shaft protector (Fig. 1 or 2).
3. Saturate the shaft and bushing using a penetrating lubricant to help loosen the bushing. Clean any grease or debris from the bushing and shaft.
4. Remove the 3 bolts attaching the bushing to the impeller.(Fig. 3) Being careful not to break the bolts. If a set screw is on the lip of the bushing, loosen it using an allen wrench.(Fig. 4)
5. Using two of the bolts that were just removed screw those bolts into the threaded holes on the bushing. Drive the two bolts into the bushing.(Fig. 5) This will separate the bushing from the impeller. Alternate from one bolt to the other driving only about a 1/4" at a time to keep the bushing coming out straight. It is imperative to keep the bushing straight to remove it.

IMPORTANT: Be sure to drive the bushing out evenly or it will get in a bind making removal much harder.

6. If the bushing does not come off using the two bolts, drill and tap several additional 3/8-16 holes around the bushing. Using Grade 8, 3/8-16 - 2 inch bolts, alternately drive the bolts 1/4" at a time to remove the bushing. KEEP THE BUSHING STRAIGHT while removing.

IMPORTANT: If additional holes were drilled in the bushing, it can not be reused. It must be be replaced.

7. Once the bushing has been removed use an overhead crane or other suitable device to help lift the impeller out of the blower housing.
8. At this point it would be a good idea to inspect the blower housing liners and blower housing for any damage or wear. Any damage or wear to the liners should be fixed by replacing the liners immediately.

Fig. 1

Direct Drive

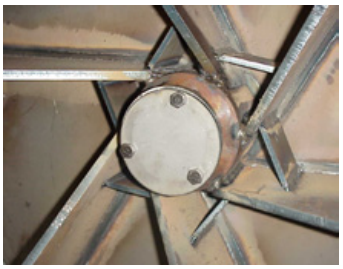


Fig. 2

Belt Drive

Fig. 3

Fig. 4

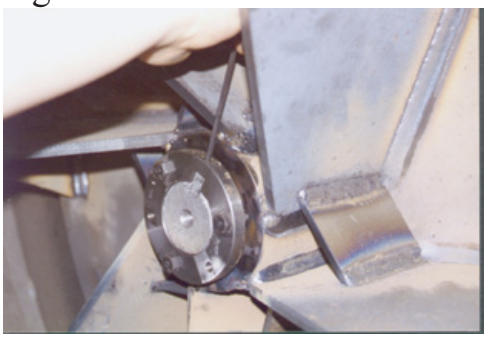


Fig. 5

## 5.4 Impeller Installation and Removal, continued

**⚠ CAUTION**

Before removing the blower housing face remove the negative battery cable to ensure unit can not be started.

INSTALLATION

1. Clean the shaft of any debris and remove any rust using a 120 grit emory cloth.
2. Using an overhead crane or other suitable lifting device lift the impeller on to the shaft. Turn the impeller to align the keyways of the shaft with the keyway in the impeller.
3. Insert key into the keyway. A light sanding of the keyway may be needed, as well as a few light blows with a rubber mallet.
4. apply a generous coat of anti-sieze compound to the outside of the bushing being sure to cover any area that will come in contact with the impeller.
5. Tap the bushing onto the shaft aligning the keyways.
6. BELT DRIVE UNITS: Align the bushing and key to be flush with the end of the shaft (Fig 1).
7. DIRECT DRIVE UNITS: The bushing and key should protrude from the shaft about 1/2 inch (Fig. 2).
8. Put the 3 bolts into the non-threaded holes and drive them into the impeller holes evenly. Alternate between the three bolts as you drive the bolts in. Torque to 40 to 50 lbs/ft. There should be a gap of 3/8" to 1/2" between the bushing and the impeller.

IMPORTANT: Slowly spin the impeller by hand making sure that the back of the impeller is not hitting any of the bolt heads located at the back of the blower housing.

9. If the bushing has a set screw on it, tighten the screw snug with an allen wrench (Fig. 3). This will help keep the key in place.
10. Install the shaft protector on to the shaft (Fig. 4 or 5).

Fig. 1

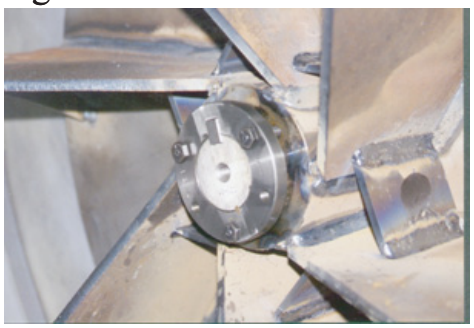


Fig. 2

Fig. 3

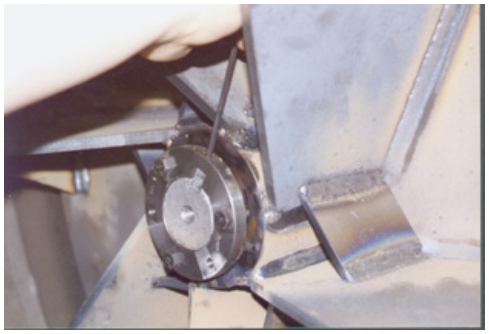


Fig. 4

Direct Drive

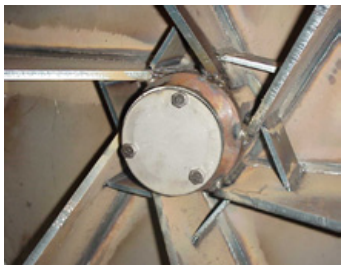


Fig. 5

Belt Drive

## 5.5 Belt Adjustment and Replacement Guide

**⚠ CAUTION** Before opening the belt cover emove the negative battery cable to ensure unit can not be started.

### Belt Removal

1. Make sure the leaf vacuum is not running and remove the battery cable from the negative battery terminal to ensure that the unit cannot be accidentally started.
2. Open the belt guard assembly to gain access to the belt and pulleys.
3. Loosen the four motor mount bolts (Items A and B, figures #1 and #2) located above the motor mount adjustment brackets.
4. To create slack in the belt, the motor assembly needs to be moved toward the blower housing. Locate the adjustable motor mount nuts (C) at the rear of the unit (figure #3). Use a 7/8" socket to turn the nuts counter-clockwise alternating between the left and right mounts. Move one side approximately two inches then move the other side to keep the mounts from binding.
5. Continue moving the motor inward until the belt is loose enough to be removed.

Belt Replacement

1. Place the belt around the two pulleys, aligning the grooves of the belt with the grooves of the pulley.
2. The motor assembly needs to be moved back away from the blower housing to tighten the belt. Using the adjustable motor mount nuts at the rear of the unit (Item C, figure #3) turn one of the nuts clockwise to start moving the motor assembly. Move the motor assembly approximately two inches then do the same to the other side. Continue alternating between the two sides until the belt is tight.
3. IMPORTANT: Use a straight edge to make sure the pulleys are aligned (figure #4).
4. If the pulleys are not aligned use either of the adjustable motor mount nuts to compensate for the mis-alignments. Check the tightness at the center of the belt between the two pulleys. The belt should depress approximately 1/2".
5. Tighten down the 2 bolts closest to the blower housing (Item A, figures #1 and #2). Loosen the adjustable motor mount nuts (Item C, figure #3) by turning counter-clockwise a couple of turns until the front 2 motor mount bolts (Item B, figures #1 and #2) are competely straight. The motor assembly should not move, if it does move then the bolts (Item A) were not tight enough and the belt would need to be readjusted using the steps above. Once the bolts (Item B) are straight tighten them down.
6. Close the belt guard assembly and secure it with the latches.
7. Re-attach the battery cable to the negative battery post.
8. Start the engine and increase the throttle to 750 RPM's.
9. Engage the clutch, listening for any squealing from the belt. If the belt squeals use the above directions to tighten the belt a little more.
10. After approximately 8 hours of use the new belt should be checked for proper tightness in case the belt stretched.

Figure #1

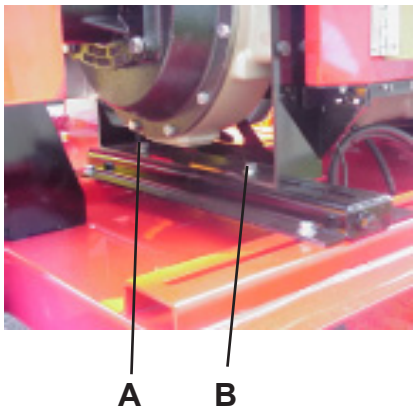



Figure #2

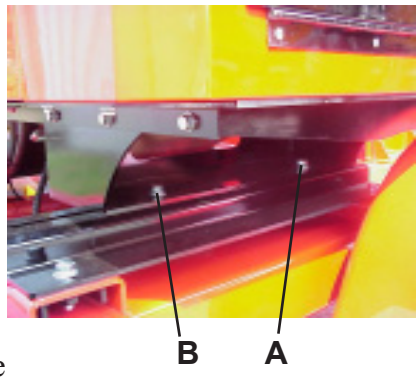



Figure #3

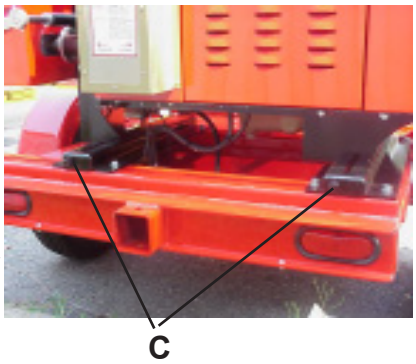



Figure #4

## 5.6 Flange Bearing Installation and Removal

FIGURE #1

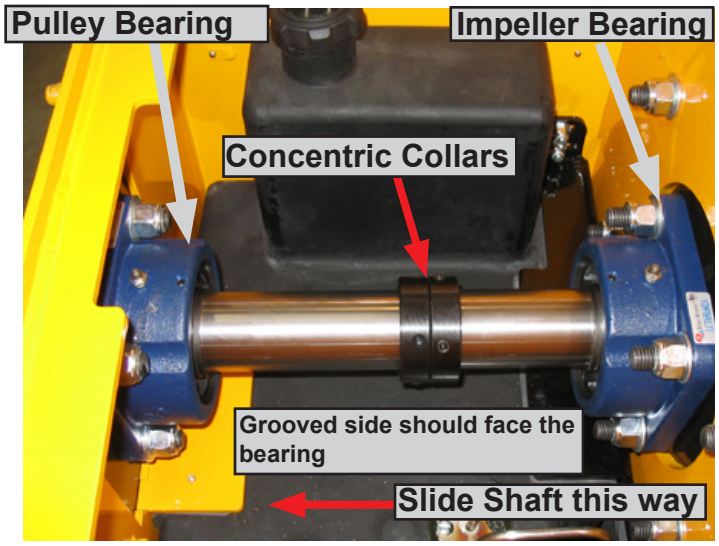
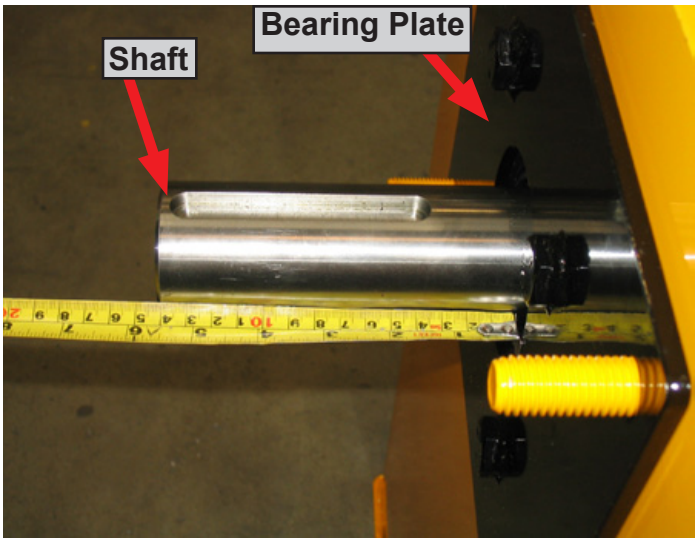



FIGURE #2

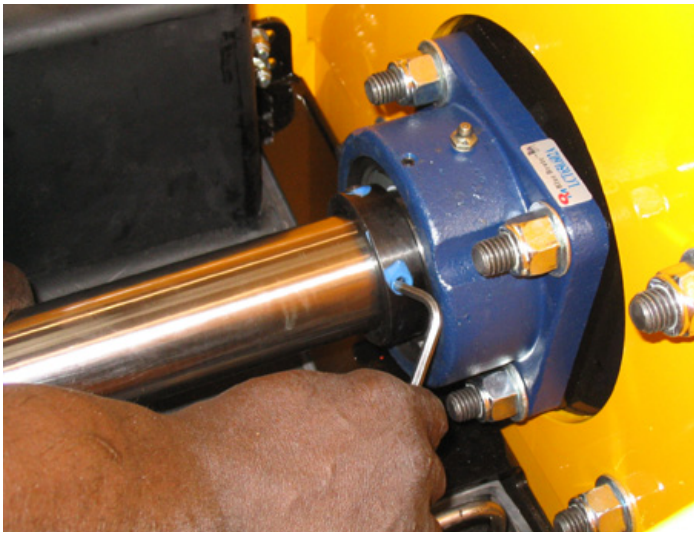



1. Place the bearings on to the black bearing plates inside the pedistal. Hand tighten the bolts onto the nuts at this point.
2. Slide the shaft through the back of the impeller bearing and half way to the pulley bearing. The shaft should fit tight. Clean the shaft and remove any burrs if necessary. Also lightly polishing it with a fine emery may ease installation.
3. Before going through the pulley bearing, place both concentric collars (black collars) onto the shaft (figure #1). Make sure the grooved side is facing the bearing.
4. Continue sliding the shaft through the pulley bearing until the shaft protrudes out from the pulley side 5-5/8". (Figure #2)
5. Now slide the concentric collar toward the respective bearing making sure the grooved side is toward the bearing.
6. Turn the concentric collar clockwise until it slips over the inner ring extension and engages the eccentric. Turn by hand until the parts are locket together.
7. Place a punch or drift in the blind hole in the collar and strike it sharply to lock the collar and ring tightly together (figure #3)
8. Tighten the set screws with an Allen wrench until the set screw stops turning and the Allen wrench starts to spring. (Figure #4)
9. Completely tighten all four of the nuts to secure each bearing.

Continued... →

FIGURE #3

FIGURE #4



## 5.7 Impeller Installation and Removal

FIGURE #5

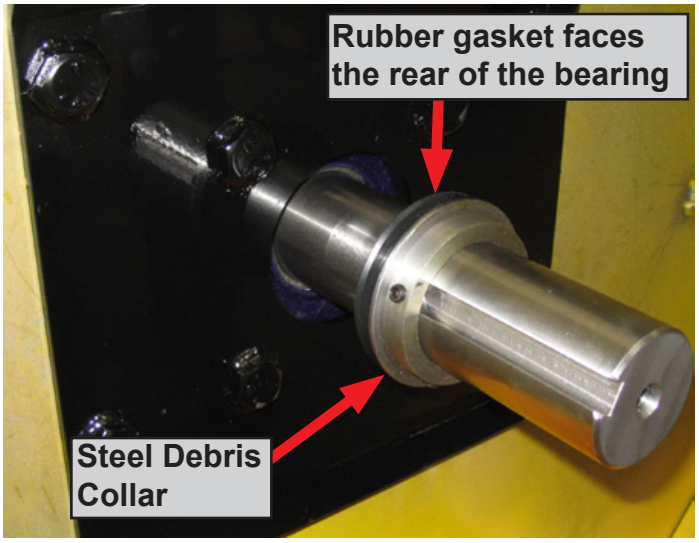



FIGURE #6

1. Now move to the blower housing where the shaft comes out from the bearing. Put the steel debris collar (chrome color with a rubber seal on one side) onto the shaft with the rubber gasket side facing the rear of the bearing (away from the impeller). See Figure #5.

2. Push the steel collar seal up to the bearing and make sure the groove in the collar goes inside the groove in the bearing. (Figure #6) This creates the sealed fit to keep debris out of the bearing.

NOTE:

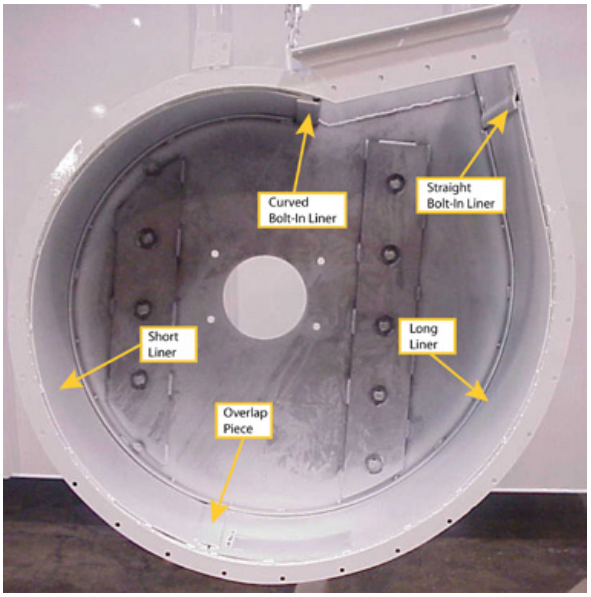
3. If the collar is too large for the hole in the bearing plate, a "new style" bearing plate will need to be ordered that has a larger diameter hole. Units manufactured before April 2002 will most likely need to be converted to the new bearing plate (part number LCT600.603 {all but LCT6000} and LCT630.104A for the LCT6000. This plate is for the blower housing or impeller side only. The pulley side bearing does not use the steel debris collar.

4. Completely tighten the two Allen head screws. See figure #6.

NOTE:
Each bearing comes with a steel debris collar but it will be used only on the bearing on the impeller side. You may discard the other collar if you're replacing the pulley bearing.

## 5.8 Replacing the Blower Housing Liners

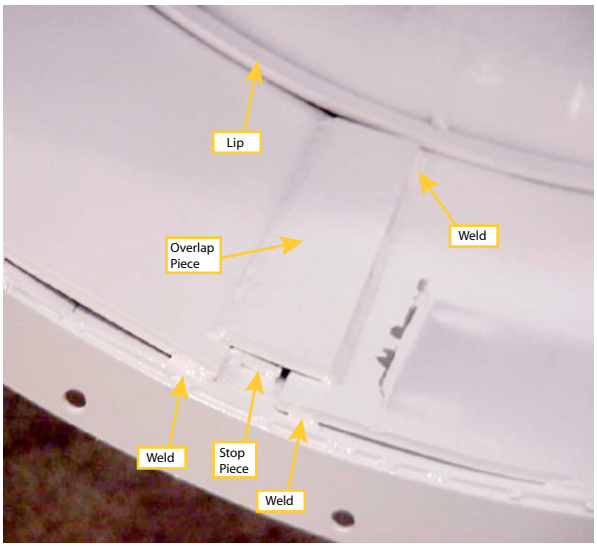
figure 5.5a




**⚠WARNING**

**Keep all fuel and fuel fumes away from the unit when grinding or welding. Work only in a well ventialted area.**

figure 5.5b




**⚠WARNING**

**Thoroughly read and understand the safety and pre-operating sections of this manual before working on the unit.**

**⚠WARNING**

**Make sure the negative battery cable is disconnected before opening the blower housing.**

Review the safety section of this manual before attempting these procedures. To gain access to the interior of the blower housing please see the previous sections.

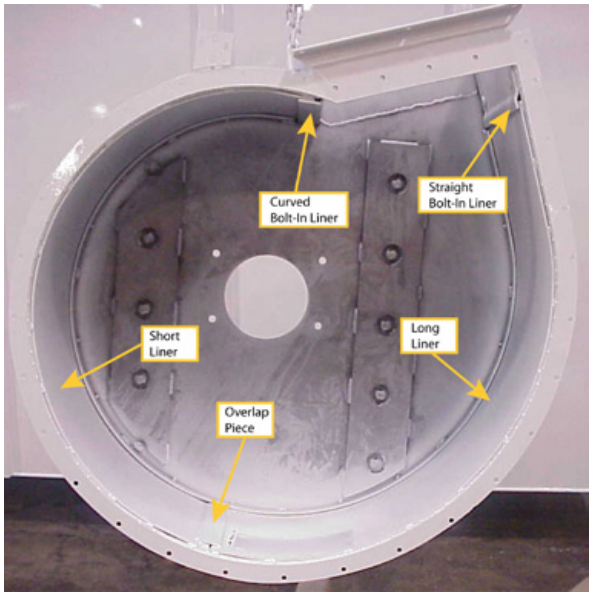
**Removing and installing the Liners (refer to 5.5a and 5.5b):**

1. Unbolt the the blower housing face as described previously in this manual.
2. Remove the curved and straight bolt-in liners by removing the appropriate bolts.
3. With a grinder cut out the remaining welds to free the liners. DO NOT remove the "stop piece" at the bottom of the housing.

TO INSTALL:

1. Place the short liner into lip at the rear of the housing and line up the bottom of the liner with the "stop" at the bottom of the housing. The short liner has the overlap piece on it and should be installed as shown in the pictures at the left.
2. Tack weld the liner in place every 8 to 10 inches to help keep the liner in place.

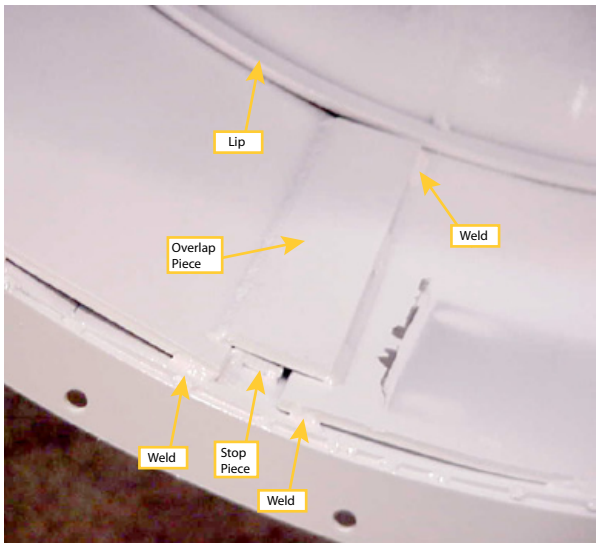
figure 5.5a




**⚠WARNING**

**Keep all fuel and fuel fumes away from the unit when grinding or welding. Work only in a well ventialted area.**

figure 5.5b




**⚠WARNING**

**Thoroughly read and understand the safety and pre-operating sections of this manual before working on the unit.**

**⚠WARNING**

**Make sure the negative battery cable is disconnected before opening the blower housing.**

Review the safety section of this manual before attempting these procedures. To gain access to the interior of the blower housing please see the previous sections.

**Installing the Liners (refer to 5.5a and 5.5b), continued;**

3. Install the long liner the same way as the short liner except the long liner should slip under the overlap piece. Make sure the liner slips under the rear lip and the overlap piece.

4. Tack weld the long liner to the overlap piece and tack weld around the liner as you did on the short liner.

5. Install the two bolt-in liners just as they were removed.

WIRING DIAGRAMS

# JOHN DEERE WIRING DIAGRAMS

5.8 Engine Wiring Diagram
5.9 Engine Main Harness - Enlarged
5.10 Auxillary Engine Harness - Enlarged
5.11 Engine Wiring Harness Descriptions
5.12 Engine Rocker Switch Wiring Diagrams
5.13 Main Circuit Board
5.14 Main Circuit Board Plug Diagrams

5.15 Trailer Plug Wiring Diagram
5.16 Engine Wiring Harness Descriptions
5.17 Boom Wiring Diagram
5.18 Remote Throttle / Clutch Wiring Harness

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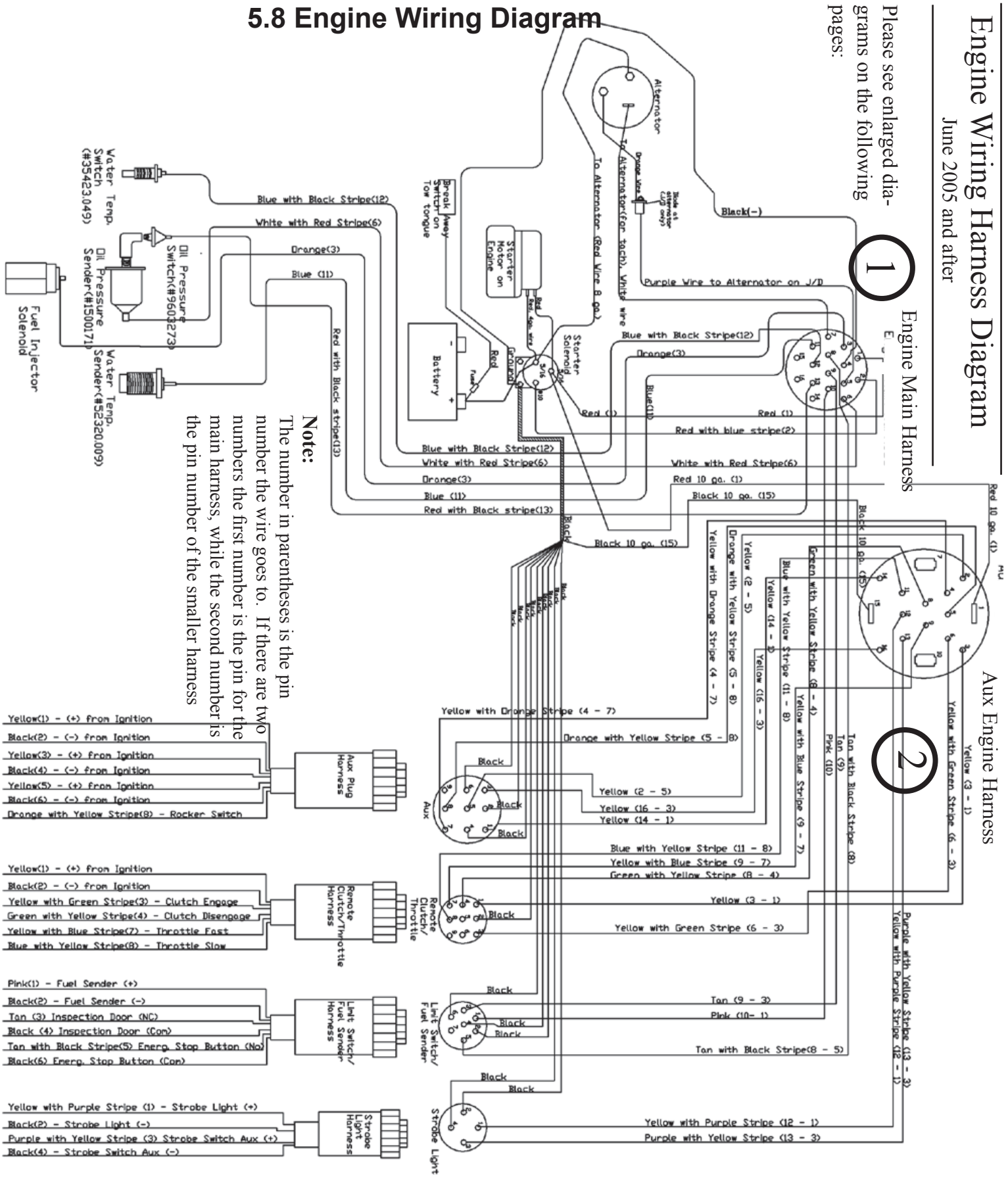
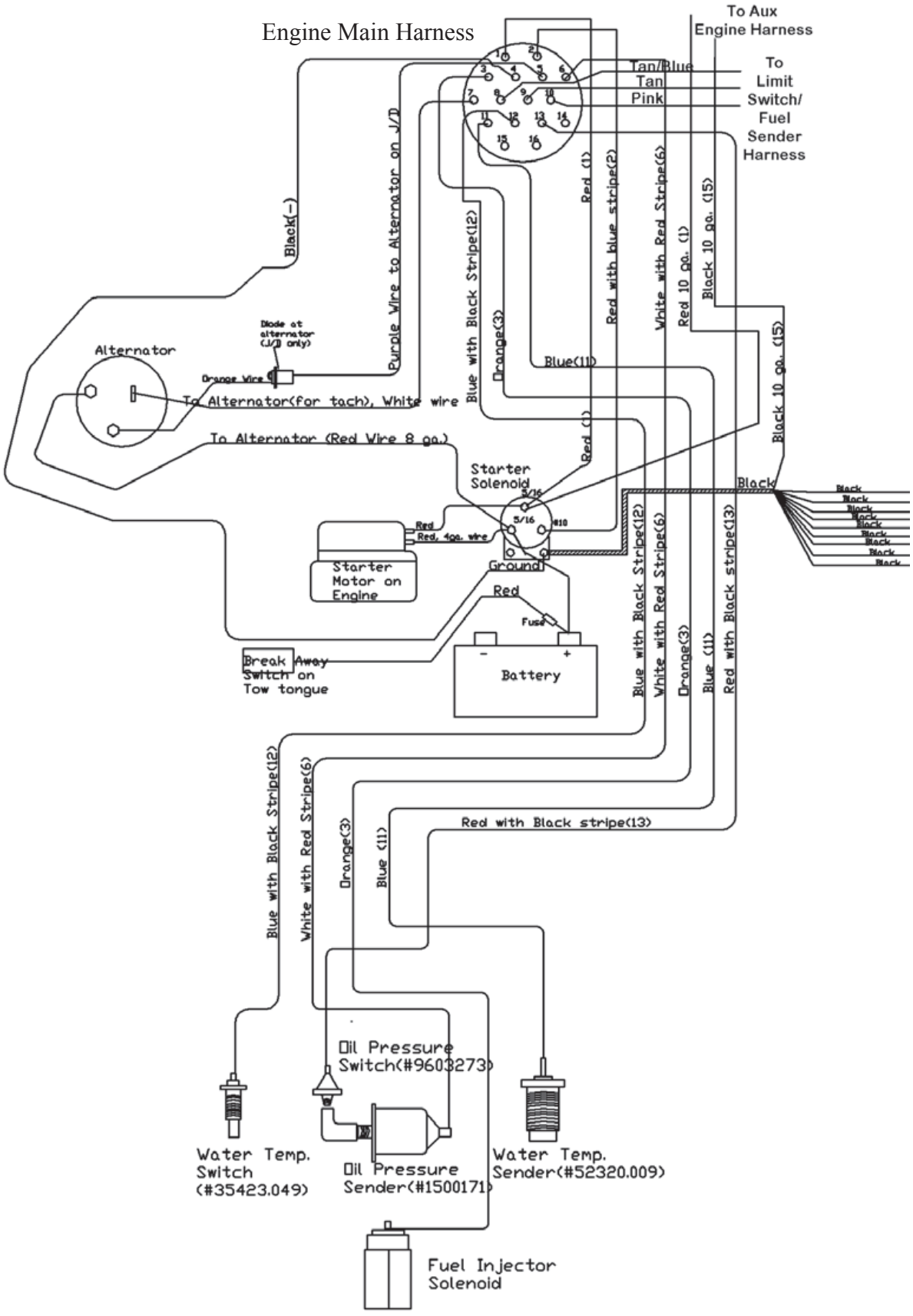
## 5.8 Engine Wiring Diagram

Please see enlarged diagrams on the following pages:

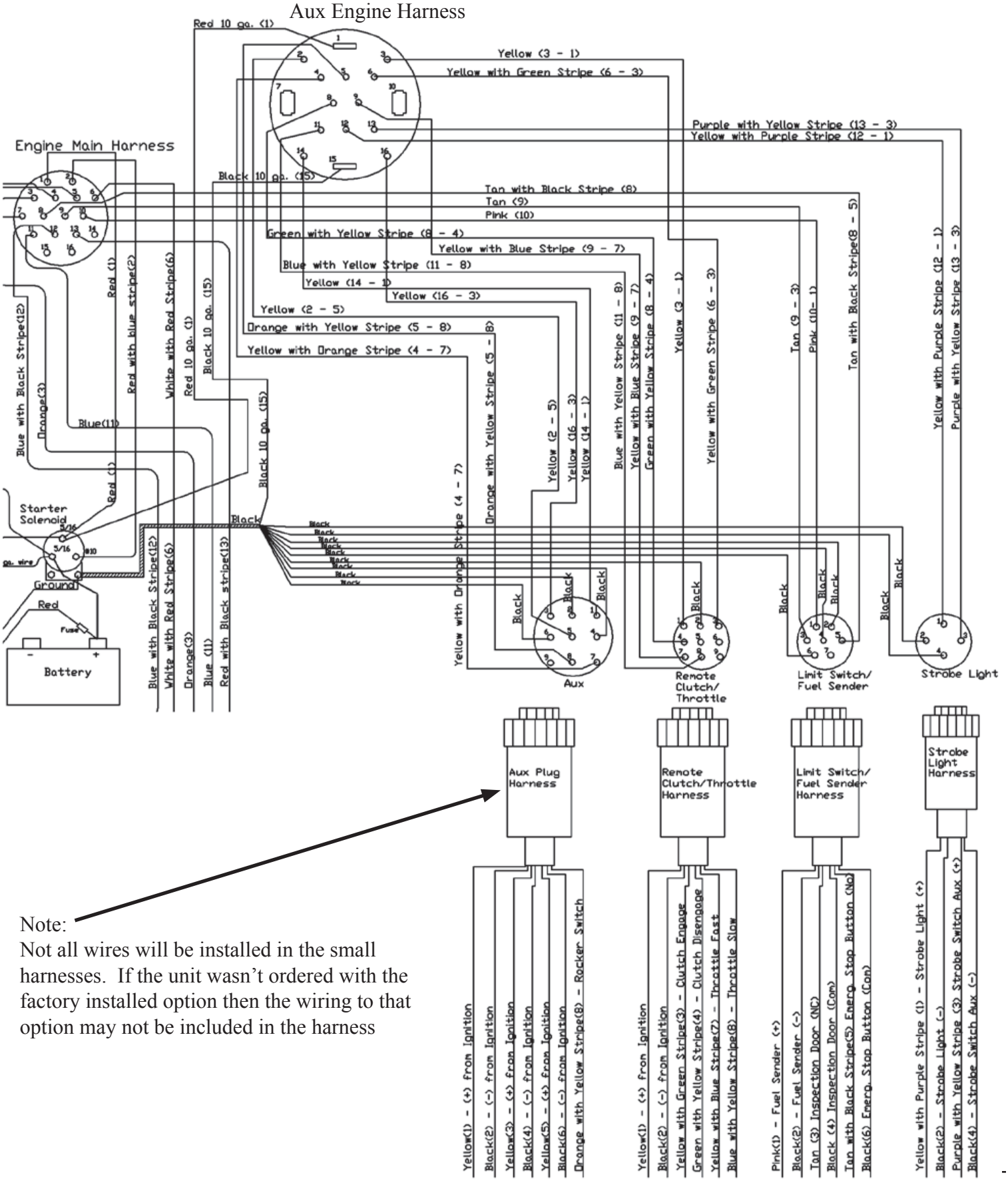

Engine Wiring Harness Diagram
June 2005 and after
1
Engine Main Harness
2
Aux Engine Harness
Alternator
To Alternator (Red Wire 8 ga.)
To Alternator(for tach), White wire
Purple Wire to Alternator on J/D
Black(-)
Starter Motor on Engine
Starter Solenoid
Battery
Break Away Switch on Tow tongue
Water Temp. Switch (#35423049)
Oil Pressure Switch(#9603273)
Oil Pressure Sender(#1500171)
Water Temp. Sender(#52320009)
Fuel Injector Solenoid
Blue with Black Stripe(12)
White with Red Stripe(6)
Orange(3)
Blue (11)
Red with Black stripe(13)
Red with blue stripe(2)
Red 10 ga. (1)
Black 10 ga. (15)
Yellow with Orange Stripe (4 - 7)
Orange with Yellow Stripe (5 - 8)
Yellow (2 - 5)
Yellow (16 - 3)
Yellow (14 - 1)
Blue with Yellow Stripe (11 - 8)
Yellow with Blue Stripe (9 - 7)
Green with Yellow Stripe (8 - 4)
Yellow (3 - 1)
Yellow with Green Stripe (6 - 3)
Tan (9 - 3)
Pink (10- 1)
Tan with Black Stripe(8 - 5)
Yellow with Purple Stripe (12 - 1)
Purple with Yellow Stripe (13 - 3)
Aux Plug Harness
Yellow(1) - (+) from Ignition
Black(2) - (-) from Ignition
Yellow(3) - (+) from Ignition
Black(4) - (-) from Ignition
Yellow(5) - (+) from Ignition
Black(6) - (-) from Ignition
Orange with Yellow Stripe(8) - Rocker Switch
Remote Clutch/Throttle Harness
Yellow(1) - (+) from Ignition
Black(2) - (-) from Ignition
Yellow with Green Stripe(3) - Clutch Engage
Green with Yellow Stripe(4) - Clutch Disengage
Yellow with Blue Stripe(7) - Throttle Fast
Blue with Yellow Stripe(8) - Throttle Slow
Limit Switch/ Fuel Sender Harness
Pink(1) - Fuel Sender (+)
Black(2) - Fuel Sender (-)
Tan (3) Inspection Door (NC)
Black (4) Inspection Door (Com)
Tan with Black Stripe(5) Energ. Stop Button (No)
Black(6) Energ. Stop Button (Com)
Strobe Light Harness
Yellow with Purple Stripe (1) - Strobe Light (+)
Black(2) - Strobe Light (-)
Purple with Yellow Stripe (3) Strobe Switch Aux (+)
Black(4) - Strobe Switch Aux (-)

**Note:**
The number in parentheses is the pin number the wire goes to. If there are two numbers the first number is the pin for the main harness, while the second number is the pin number of the smaller harness

## 5.9 Engine Main Harness - Enlarged



## 5.10 Auxillary Engine Harness - Enlarged


Aux Engine Harness
Engine Main Harness
Red 10 ga. (1)
Yellow (3 - 1)
Yellow with Green Stripe (6 - 3)
Purple with Yellow Stripe (13 - 3)
Yellow with Purple Stripe (12 - 1)
Black 10 ga. (15)
Tan with Black Stripe (8)
Tan (9)
Pink (10)
Green with Yellow Stripe (8 - 4)
Yellow with Blue Stripe (9 - 7)
Blue with Yellow Stripe (11 - 8)
Yellow (14 - 1)
Yellow (16 - 3)
Yellow (2 - 5)
Orange with Yellow Stripe (5 - 8)
Yellow with Orange Stripe (4 - 7)
Red (1)
Red with blue stripe(2)
White with Red Stripe(6)
Red 10 ga. (1)
Black 10 ga. (15)
Blue with Black Stripe(12)
Orange(3)
Blue(11)
Red (1)
Black 10 ga. (15)
Starter Solenoid
5/16
3/16
#10
ga. wire
Ground
Red
Fuse
Battery
Blue with Black Stripe(12)
White with Red Stripe(6)
Orange(3)
Blue (11)
Red with Black stripe(13)
Black
Yellow with Orange Stripe (4 - 7)
Orange with Yellow Stripe (5 - 8)
Yellow (2 - 5)
Yellow (16 - 3)
Yellow (14 - 1)
Blue with Yellow Stripe (11 - 8)
Yellow with Blue Stripe (9 - 7)
Green with Yellow Stripe (8 - 4)
Yellow (3 - 1)
Yellow with Green Stripe (6 - 3)
Tan (9 - 3)
Pink (10- 1)
Tan with Black Stripe(8 - 5)
Yellow with Purple Stripe (12 - 1)
Purple with Yellow Stripe (13 - 3)
Aux
Remote Clutch/ Throttle
Limit Switch/ Fuel Sender
Strobe Light
Aux Plug Harness
Remote Clutch/Throttle Harness
Limit Switch/ Fuel Sender Harness
Strobe Light Harness
Yellow(1) - (+) from Ignition
Black(2) - (-) from Ignition
Yellow(3) - (+) from Ignition
Black(4) - (-) from Ignition
Yellow(5) - (+) from Ignition
Black(6) - (-) from Ignition
Orange with Yellow Stripe(8) - Rocker Switch
Yellow(1) - (+) from Ignition
Black(2) - (-) from Ignition
Yellow with Green Stripe(3) - Clutch Engage
Green with Yellow Stripe(4) - Clutch Disengage
Yellow with Blue Stripe(7) - Throttle Fast
Blue with Yellow Stripe(8) - Throttle Slow
Pink(1) - Fuel Sender (+)
Black(2) - Fuel Sender (-)
Tan (3) Inspection Door (NC)
Black (4) Inspection Door (Com)
Tan with Black Stripe(5) Energ. Stop Button (No)
Black(6) Energ. Stop Button (Com)
Yellow with Purple Stripe (1) - Strobe Light (+)
Black(2) - Strobe Light (-)
Purple with Yellow Stripe (3) Strobe Switch Aux (+)
Black(4) - Strobe Switch Aux (-)

Note:
Not all wires will be installed in the small harnesses. If the unit wasn't ordered with the factory installed option then the wiring to that option may not be included in the harness

## 5.11 Engine Wiring Harness Descriptions

| ENGINE MAIN HARNESS | | |
|---|---|---|
| **PIN #** | **COLOR** | **DESCRIPTION** |
| 1 | Red | "+" from Solenoid (battery) |
| 2 | Red w/ Blue Stripe | Starter Solenoid |
| 3 | Orange | Fuel Shutoff Solenoid |
| 4 | Black | "-" from Solenoid (battery) |
| 5 | Purple | Alternator Energize "+" |
| 6 | White w/ Red Stripe | Oil Sender |
| 7 | White | Tach Signal from Alternator |
| 8 | Tan w/ Black Stripe | Emergency Stop Button (650 only) goes to Limit Switch plug pin #5 |
| 9 | Tan | Inspection Door on Blower Housing, goes to Limit Switch plug pin #3 |
| 10 | Pink | Fuel Sender, goes to Limit Switch Plug pin #5 |
| 11 | Blue | Water Temperature Sender on Engine Block |
| 12 | Blue w/ Black Stripe | Water Temperature Switch on Engine Block |
| 13 | Red w/ Black Stripe | Oil Pressure Switch on Engine Block |
| **AUXILLARY ENGINE HARNESS** | | |
| 1 | Red 10 Gauge | "+" from Solenoid (Battery) |
| 2 | Yellow | Aux "+" from Ignition; goes to Aux Plug Harness pin #5 |
| 3 | Yellow | Aux "+" from Ignition; goes to Remote Clutch Harness pin #5 |
| 4 | | |
| 5 | | |
| 6 | Yellow w/ Green Stripe | Clutch Engage; goes to Remote Clutch Harness pin #3 |
| 7 | [empty] | |
| 8 | Green w/ Yellow Stripe | Clutch Disengage; goes to Remote Clutch Harness pin #4 |
| 9 | Yellow w/ Blue Stripe | Throttle Fast; goes to Remote Clutch Harness pin #7 |
| 10 | [empty] | |
| 11 | Blue w/ Yellow Stripe | Throttle Slow; goes to Remote Clutch Harness pin #8 |
| 12 | Yellow w/ Purple Stripe | Strobe Light "+"; goes to Strobe Light Harness pin #1 |
| 13 | Purple w/ Yellow Stripe | Strobe Light Aux; goes to Strobe Light Harness pin #3 |
| 14 | Yellow | Aux "+" from Ignition; goes to Aux Plug Harness pin #1 |
| 15 | Black 10 gauge | "-" from Solenoid (Battery) |
| 16 | Yellow | Aux "+" from Ignition; goes to Aux Plug Harness pin #3 |
| **STROBE LIGHT HARNESS** | | |
| | Yellow w/ Purple Stripe | Fuel Sender "+"; came from Engine Main Harness pin #10 |
| | Black | Strobe Light "-"; came from ground to solenoid |
| | Purple w/ Yellow Stripe | Strobe Switch Aux "+"; came from Aux Engine Harness pin #13 |
| | Black | Strobe Switch Aux "-"; came from ground on Solenoid |

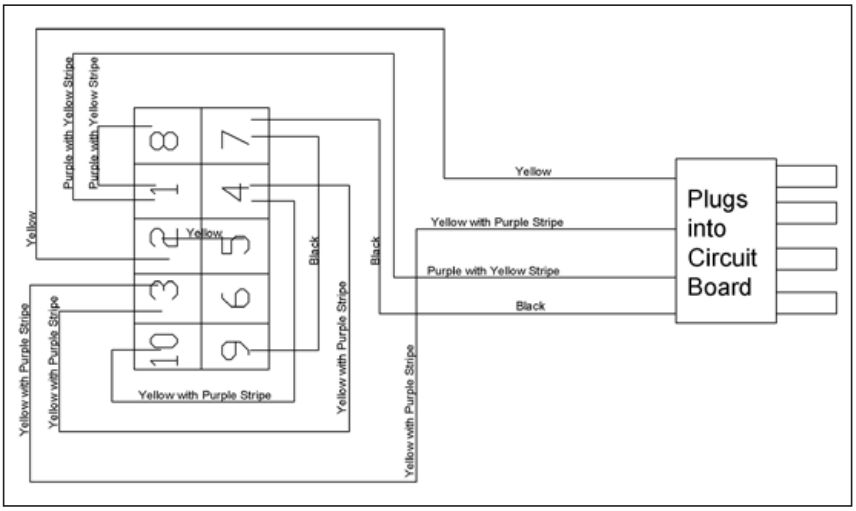
Continued ... -->

## 5.11 Engine Wiring Harness Descriptions, continued

| | | |
|---|---|---|
| **FUEL & LIMIT SWITCH HARNESS** | | |
| | Pink | Fuel Sender "+"; came from Engine Main Harness pin #10 |
| | Black | Fuel Sender "-"; came from ground to solenoid |
| | Tan | Inspection Door "+"; came from Engine Main Harness pin #9 |
| | Black | Inspection Door "-"; came from ground to solenoid |
| | Tan w/ Black Stripe | Emergency Stop Button "NO"; came from Engine Main Harness #8 |
| | Black | Emergency Stop Button "COM"; came from ground on Solenoid |
| | [empty] | |
| **REMOTE THROTTLE AND CLUTCH HARNESS** | | |
| 1 | Yellow | "+" from Ignition; came from Aux Engine Harness pin# 3 |
| 2 | Black | "-" from Ignition; came from ground on Solenoid |
| 3 | Yellow w/ Green Stripe | Clutch Engage; came from Aux Engine Harness pin# 6 |
| 4 | Green w/ Yellow Stripe | Clutch Disengage; came from Aux Engine Harness pin# 4 |
| 5 | [empty] | |
| 6 | [empty] | |
| 7 | Yellow w/ Blue Stripe | Throttle Fast; came from Aux Engine Harness pin# 9 |
| 8 | Blue w/ Yellow Stripe | Throttle Slow; came from Aux Engine Harness pin# 11 |
| 9 | [empty] | |
| **AUX PLUG IN HARNESS** | | |
| 1 | Yellow | "+" from Ignition; came from Aux Engine Harness pin# 14 |
| 2 | Black | "-" from Ignition; came from ground on Solenoid |
| 3 | Yellow | "+" from Ignition; came from Aux Engine Harness pin# 16 |
| 4 | Black | "-" from Ignition; came from ground on Solenoid |
| 5 | Yellow | "+" from ignition; came form Aux Engine Harness pin# 2 |
| 6 | Black | "-" from ignition; came from ground on solenoid |
| 7 | [empty] | |
| 8 | Orange w/ Yellow Stripe | Rocker Switch; came from Aux Engine Harness pin# 5 |
| 9 | Yellow w/ Orange Stripe | Rocker Switch; came from Aux Engine Harness |

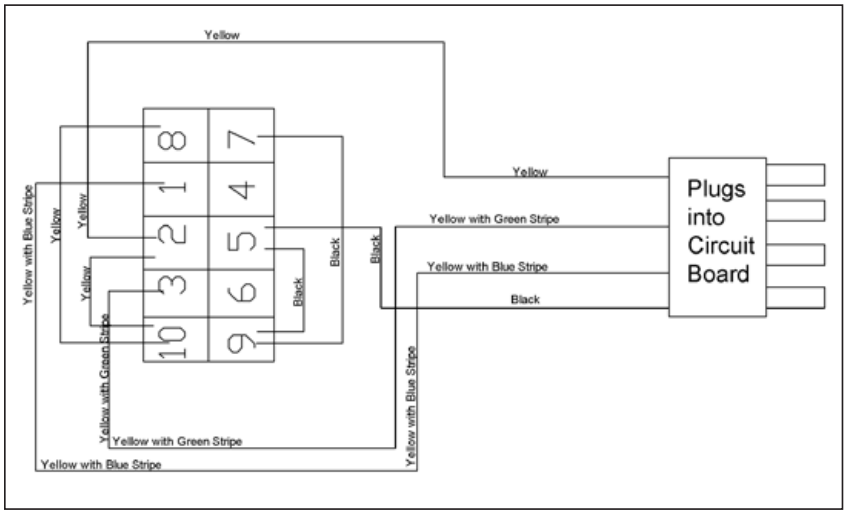
## 5.12 Engine Rocker Switch Wiring Diagrams

Strobe Light Rocker Switch




| Pin# | Color | Description |
|---|---|---|
| 1 | Purple w/ Yellow Stripe | "+" Aux from Switch |
| 2 | Yellow | "+" from Circuit Board |
| 3 | Yellow w/Purple Stripe | "+" from Strobe Light |
| 4 | Yellow w/Purple Stripe | Looped from #3 |
| 5 | Yellow | Looped from #2 |
| 6 | | |
| 7 | Black | "-" from Circuit Board |
| 8 | Purple w/Yellow Stripe | Looped from #1 |
| 9 | Black | Looped from #7 |
| 10 | Yellow w/ Purple Stripe | Looped from #4 |

Remote Throttle and Remote Clutch Rocker Switch




| Pin# | Color | Description |
|---|---|---|
| 1 | Yellow w/ Blue Stripe | Throttle Fast / Clutch Engage |
| 2 | Yellow | "+" from Circuit Board |
| 3 | Yellow w/ Green Stripe | Throttle Slow / Clutch Disengage |
| 4 | | |
| 5 | Black | "-" from Circuit Board |
| 6 | | |
| 7 | Black | Looped from #9 |
| 8 | Yellow | Looped from #10 |
| 9 | Black | Looped from #5 |
| 10 | Yellow | Looped from $2 |

This plug is used for the Remote Throttle and the Remote Clutch Rocker Switches.

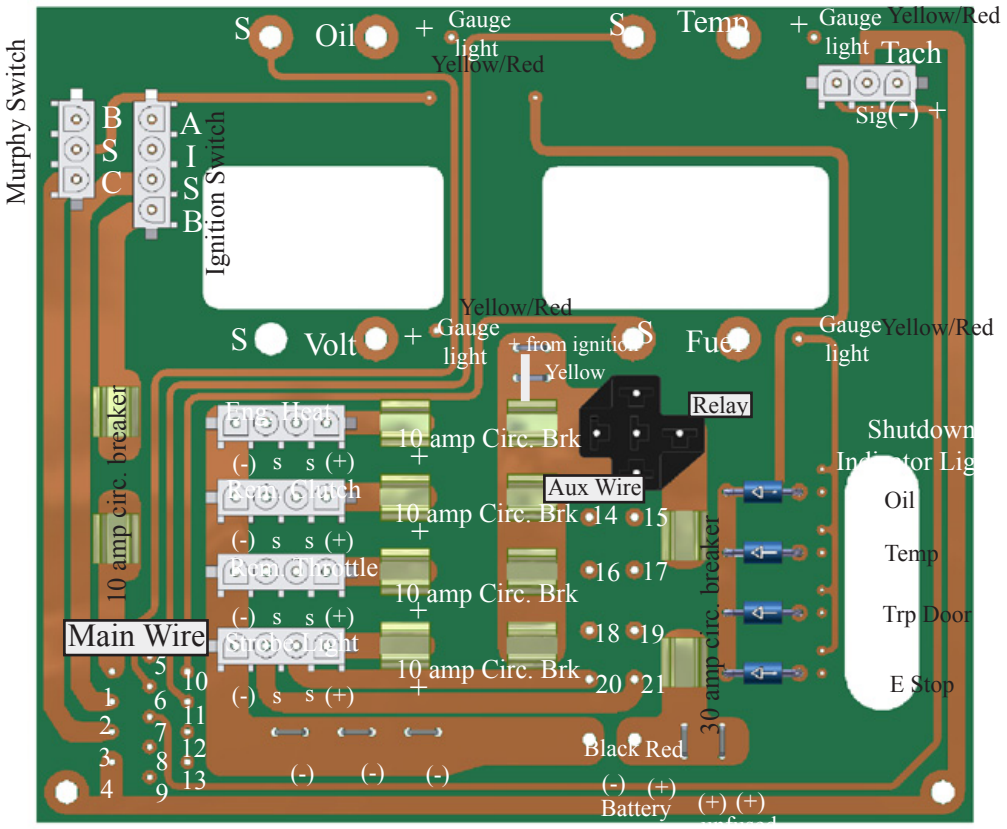
## 5.13 Main Circuit Board

TOP LAYER

The circuit board has traces on 2 layers - the top and bottom.

Main Plug Wire ID's

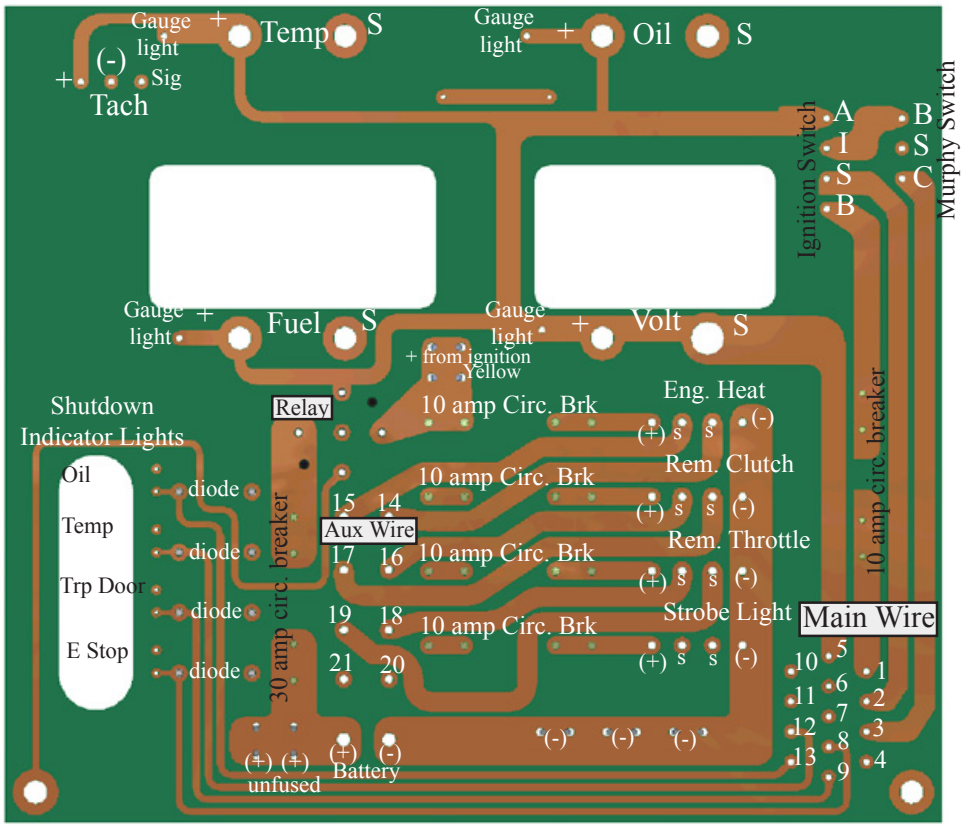
| | |
|---|---|
| 1 | + from Battery (Red) |
| 2 | Starter + (Red/Blue) |
| 3 | Fuel Sol./Col + (Orange) |
| 4 | Ground (Black) |
| 5 | Alt Energize + (Purple) |
| 6 | Oil Signal (White/Red) |
| 7 | Tach Signal (White) |
| 8 | E Stop Sig. (Tan/Black) |
| 9 | Insp. Door Sig. (Tan) |
| 10 | Fuel Level Sig. (Pink) |
| 11 | Temp Sig. (Blue) |
| 12 | Temp Shtdwn Sig (Blue/Blk) |
| 13 | Oil Shutdown Sig. (Red/Blk) |




BOTTOM LAYER
(looking from the back

Aux Plug Wire ID's

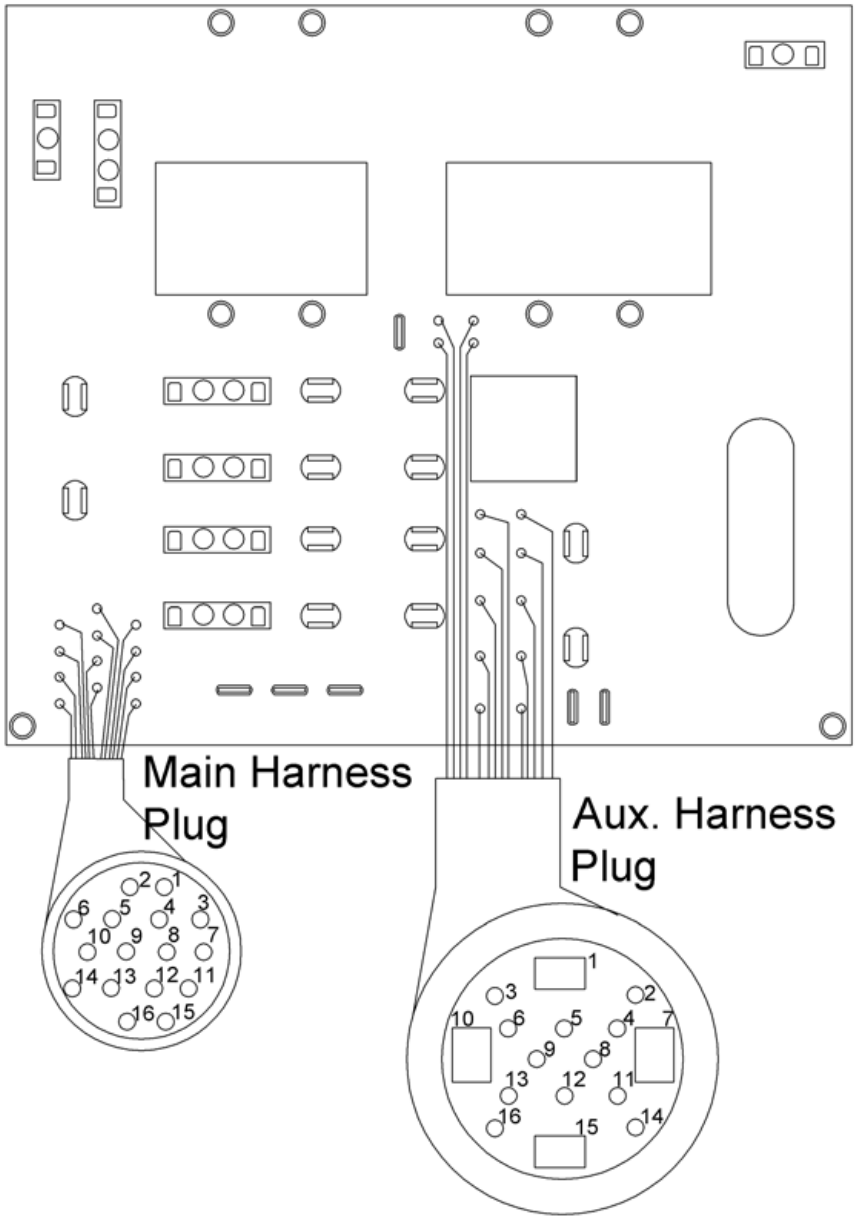
| | |
|---|---|
| 14 | Eng Heat (+) (Yellow/Orange) |
| 15 | Eng. Heat Aux (Orange/Yellow) |
| 16 | Clutch Engage (Yellow/Green) |
| 17 | Clutch Disengage (Green/Yel) |
| 18 | Throttle Fast (Yellow/Blue) |
| 19 | Throttle Slow (Blue/Yellow) |
| 20 | Strobe Light + (Yellow/Purple) |
| 21 | Aux Light + (Purple/Yellow) |



## 5.14 Main Circuit Board Plug Diagrams

**Main Harness Plug**

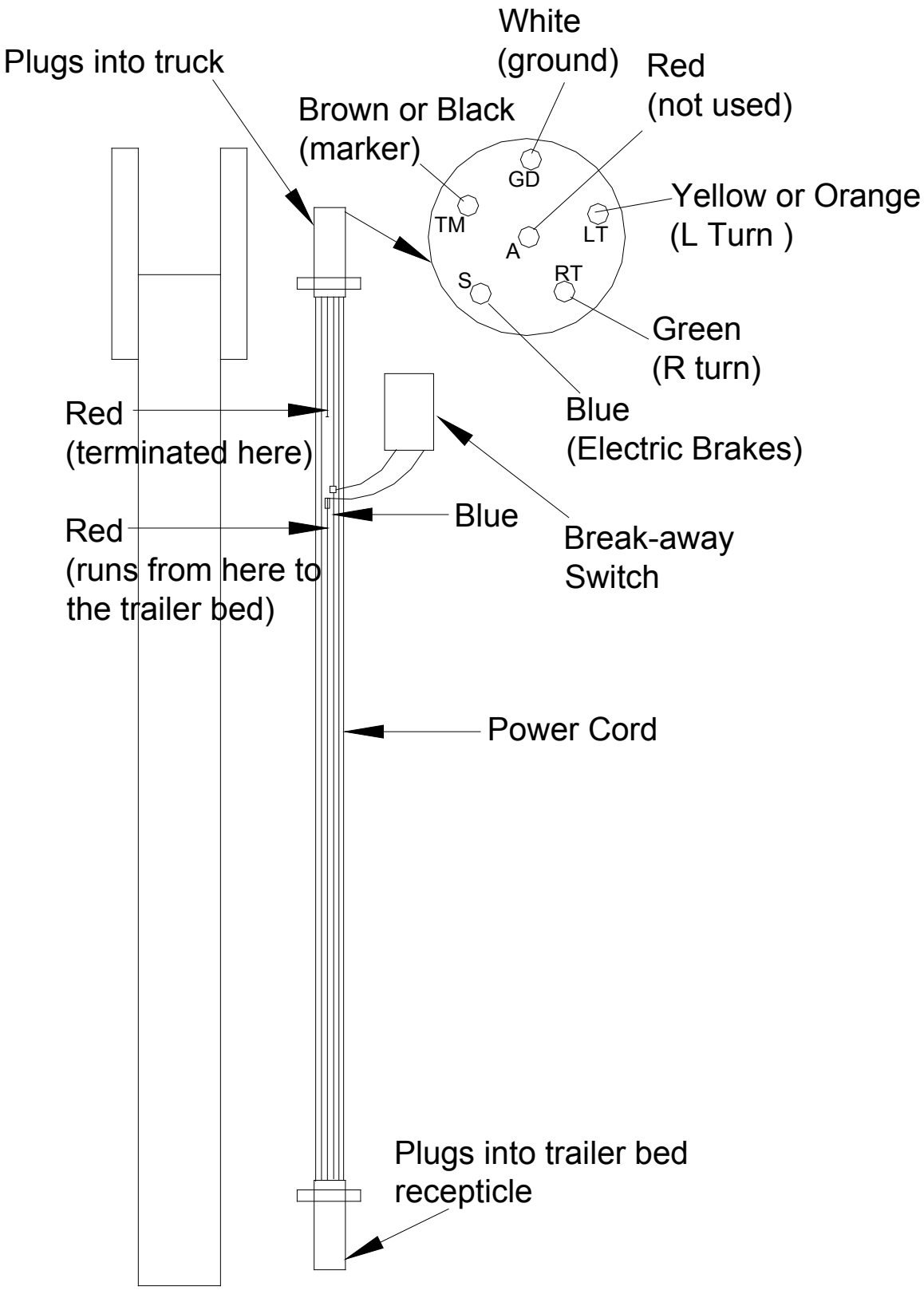
| Pin# | Description |
|---|---|
| 1 | Red + from battery |
| 2 | Red / Blue stripe - starter + |
| 3 | Orange - Fuel Sol./Col + |
| 4 | Black - Ground |
| 5 | Purple Alt Energize + |
| 6 | White / Red stripe Oil Signal |
| 7 | White - Tach Signal |
| 8 | Tan / Black stripeE Stop Sig. |
| 9 | Tan - Insp. Door Signal |
| 10 | Pink - Fuel Level Signal |
| 11 | Blue - Temp Signal |
| 12 | Blue/Black Temp Shtdwn Sig |
| 13 | Red/Black Oil Shutdown Sig. |
| 14 | Empty |
| 15 | Empty |
| 16 | Empty |



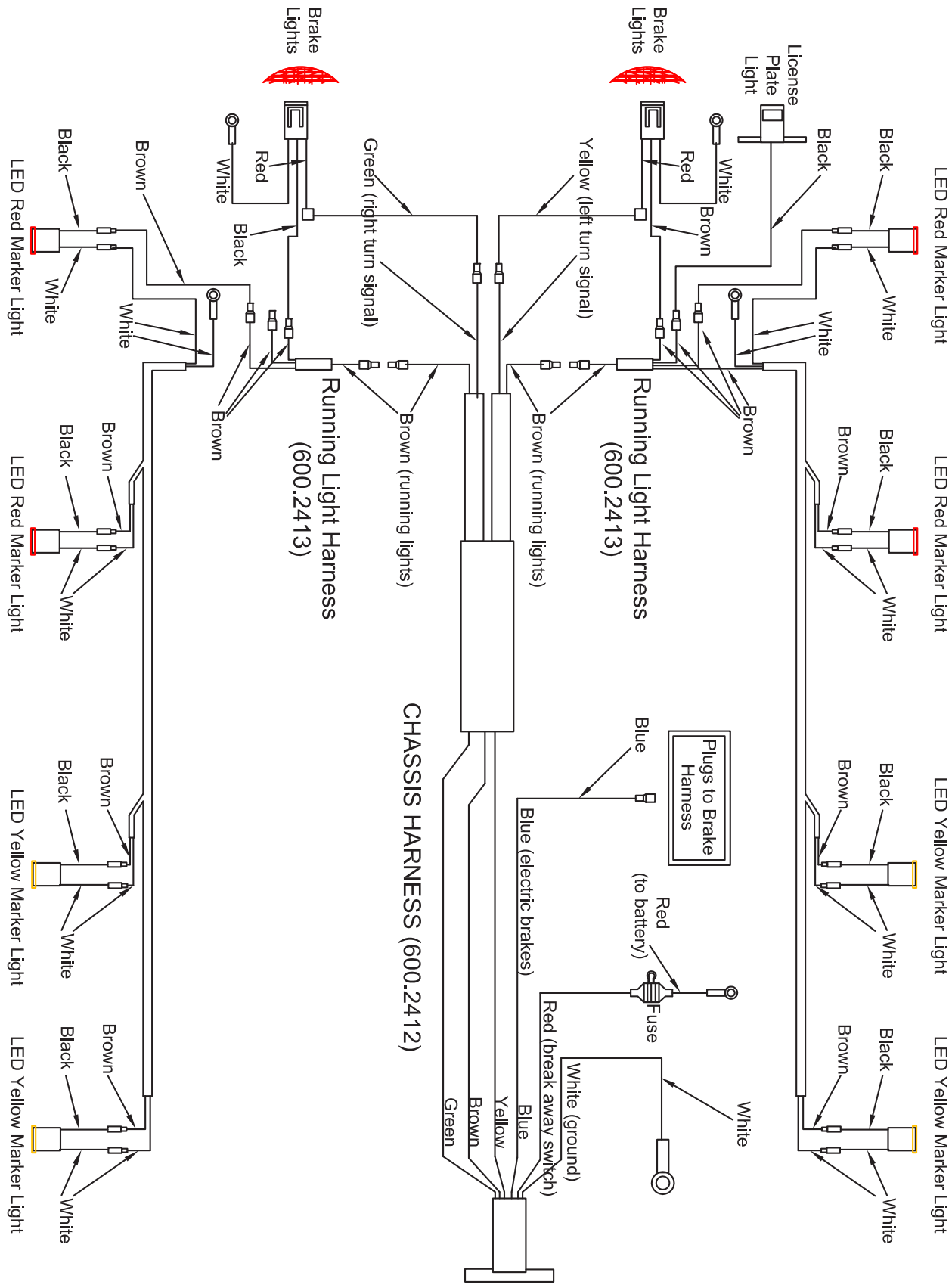

**Aux. Harness Plug**

| Pin# | Description |
|---|---|
| 1 | Red + from battery |
| 2 | Yellow - Aux Plug harness |
| 3 | Yellow - Remote Throttle Har |
| 4 | Yellow / Orange stripe-Aux har |
| 5 | Orange / Yellow stripe-Aux har |
| 6 | Yellow / Green stripe-Clutch Eng |
| 7 | Empty |
| 8 | Green / Yellow stripe-Clutch Diseng |
| 9 | Yellow / Blue stripe-Throttle Fast |
| 10 | Empty |
| 11 | Blue / Yellow stripe-Throttle Slow |
| 12 | Yellow / Blue stripe-Strobe + |
| 13 | Purple / Yellow stripe-Strobe Sw+ |
| 14 | Yellow - Aux Harness |
| 15 | Black - battery |
| 16 | Yellow - Aux Harness |

## 5.15 Trailer Plug Wiring Diagram

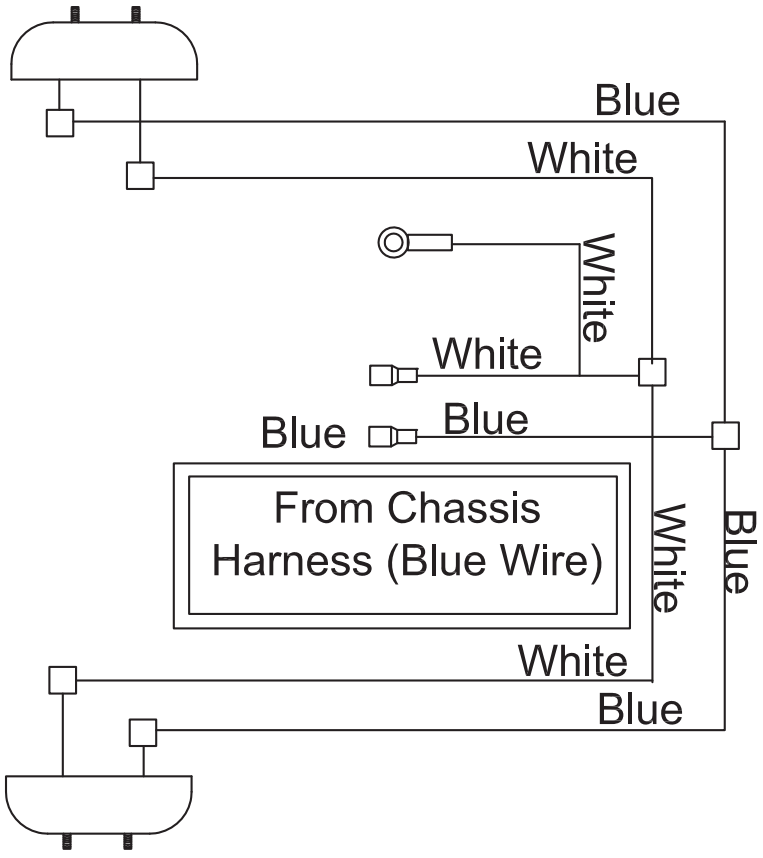


## 5.16 Engine Wiring Harness Descriptions

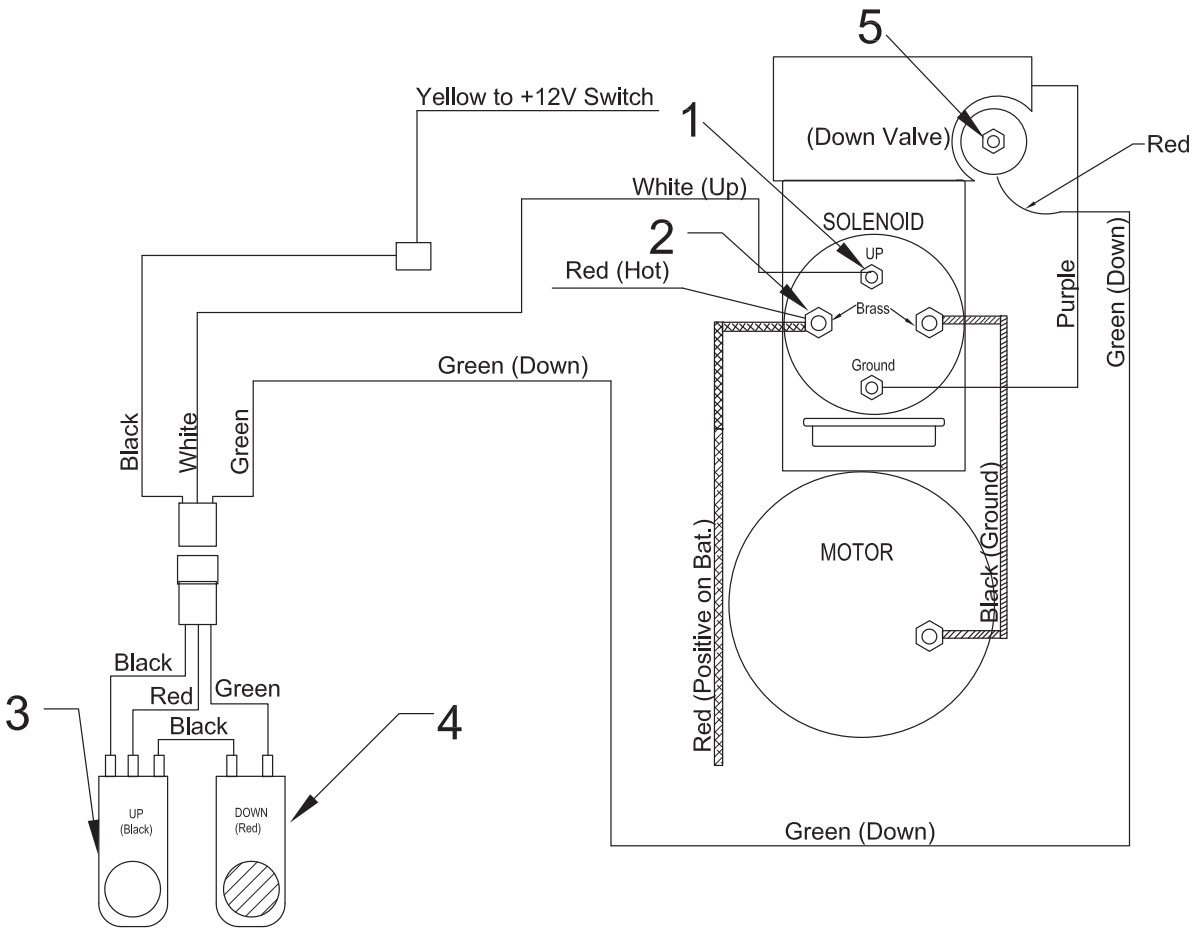


## 5.17 Brake Wiring Harness

# BRAKE HARNESS (600.613)

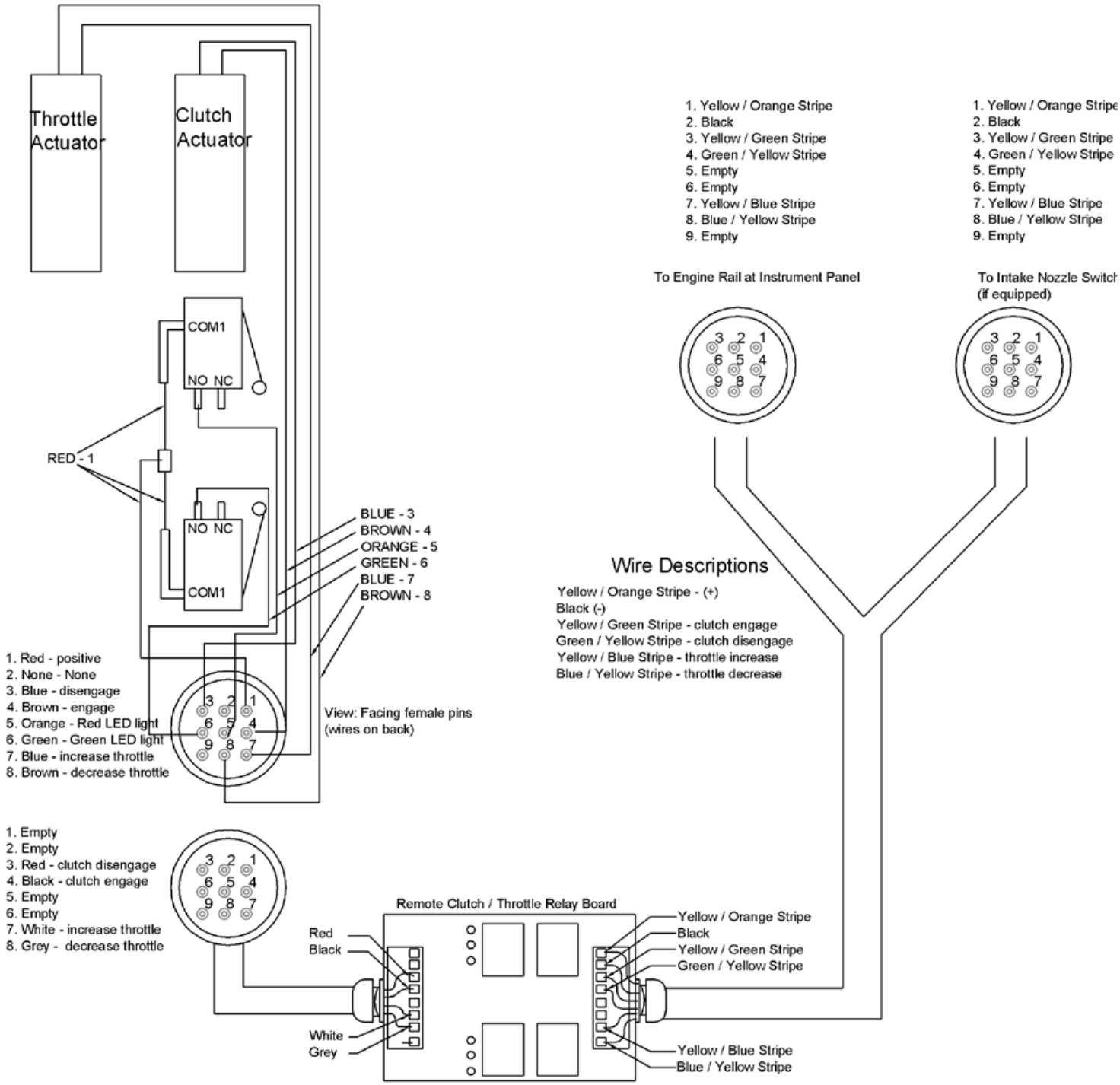


## 5.17 Boom Wiring Diagram




| COLOR | FUNCTION |
|---|---|
| Green | Down |
| White | Up |
| Purple | Ground on Solenoid |
| Red (4 gauge cable) | Positive to Battery |
| Black (4 gauge cable) | Ground from Solenoid to Hydraulic Motor |
| Black (from up down switch) | changes to Yellow - Positive for Boom Rocker Switch on instrument panel (if equipped) |

## 5.18 Remote Throttle / Clutch Wiring Harness



# PARTS BREAKDOWNS SECTION

ENGINE GROUP
CLUTCH GROUP
BLOWER HOUSING GROUP
TRAILER GROUP
HOSE BOOM GROUP

PARTS BREAKDOWN SECTION

**GVM-Vac**
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# 6-0

## 6.0 ENGINE GROUP

- 6.1 Instrument Panel Group
- 6.2 Air Cleaner Group
- 6.3 Strobe Light Parts Group
- 6.4 Sheet Metal Group
- 6.5 Engine Mount Group
- 6.6 Muffler (Exhaust) Assembly
- 6.7 Radiator Assembly Group
- 6.8 Engine Senders / Switch Group
- 6.9 Battery Group
- 6.10 Engine Miscelleous Parts Group
- 6.11 Remote Clutch / Throttle Circuit Board Assembly
- 6.12 Remote Clutch and Remote Throttle Assembly



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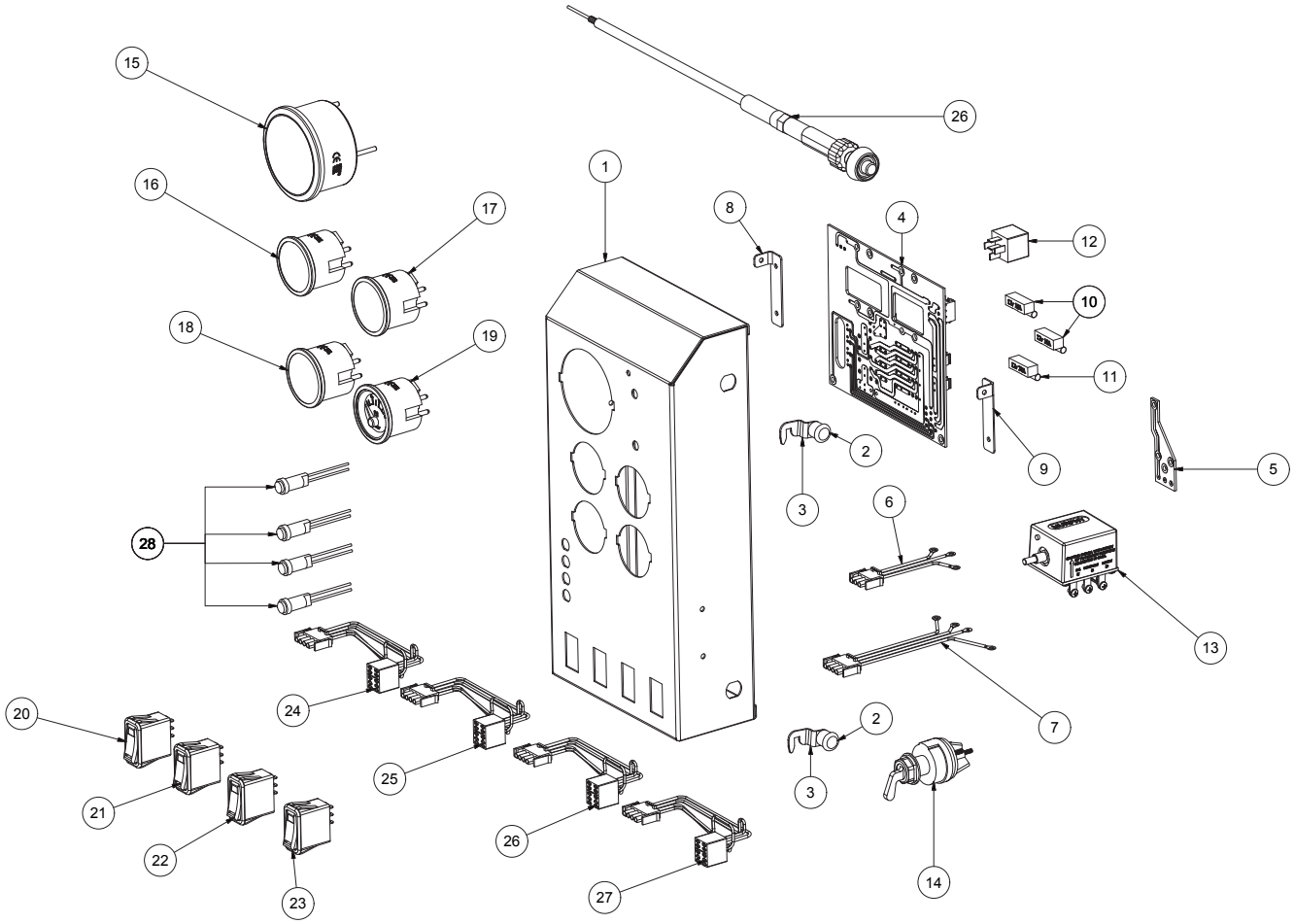
**800-632-7989**

# 6.1 Instrument Panel Group

Standard units Nov 2008 and after

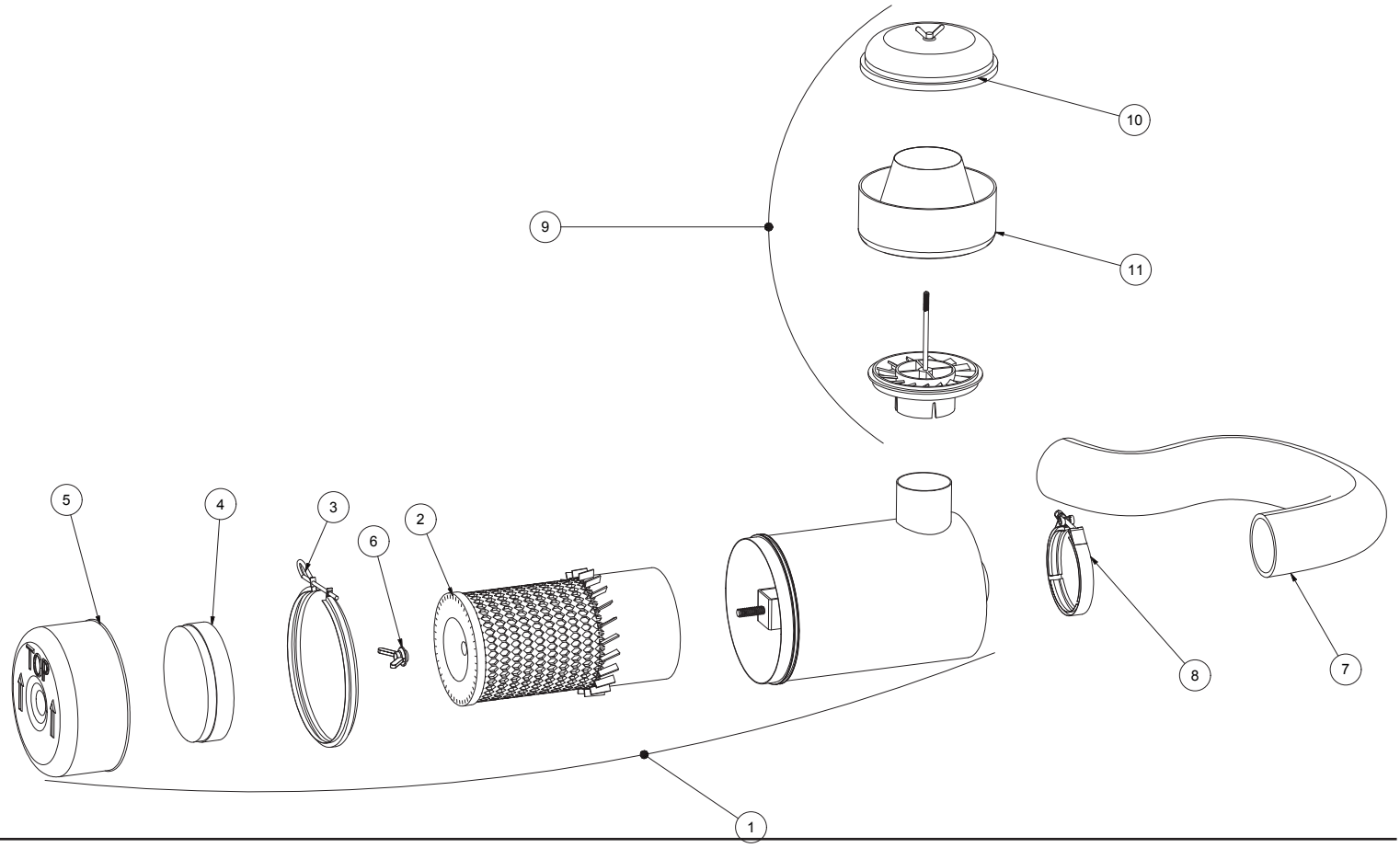



| ITEM# | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | STD.6300<br>STD.6301 | Instrument Panel Complete<br>Inst.Panel Housing with latches |
| 2 | STD.6308 | Latch |
| 3 | STD.6309 | Latch Hook |
| 4 | STD.2005 | Circuit Board |
| 5 | STD.2006 | Tachometer Circ. Board |
| 6 | 400022 | Murphy Swith Harness Plug |
| 7 | 400021 | Ign. Switch Harness Plug |
| 8 | STD.6303 | Circ. Brd Supp Brkt, LH |
| 9 | STD.6302 | Circ. Brd Supp Brkt, RH |
| 10 | 100014.10 | Circuit Breaker, 10 amp |
| 11 | 30410.30 | Circuit Breaker, 30 amp |
| 12 | 0.332.209.151 | Relay |
| 13 | MO-P81505 | Murphy Switch |
| 14 | 31.253 | Ignition Switch |

| ITEM# | PART NO. | DESCRIPTION |
|---|---|---|
| 15 | 63524 | Tachometer / Hour Meter |
| 16 | 62540 | Temperature Gauge |
| 17 | 62542 | Oil Pressure Gauge |
| 18 | 62551<br>59414 | Fuel Gauge (if equipped)<br>Blank Gauge |
| 19 | 62555 | Volt Meter |
| 20 | 4045.0021B1 | Rocker Switch,Safety Light |
| 21 | 4045.0021A1 | Rocker Switch, Rem. Thrttle |
| 22 | 4045.0025A | Rocker Switch, Rem. PTO |
| 23 | 3054.0028. | Rocker Switch, Engine Heat |
| 24 | STD.2003 | Switch Harness, Light |
| 25 | STD.2004 | Switch Harness, Rem Thrtle |
| 26 | STD.2004 | Switch Harness, Rem PTO |
| 27 | STD.2002 | Switch Harness, Eng Heat |
| 28 | STD.1502B | LED Light Assembly |
| 29 | LCT623.001A | Throttle Cable |

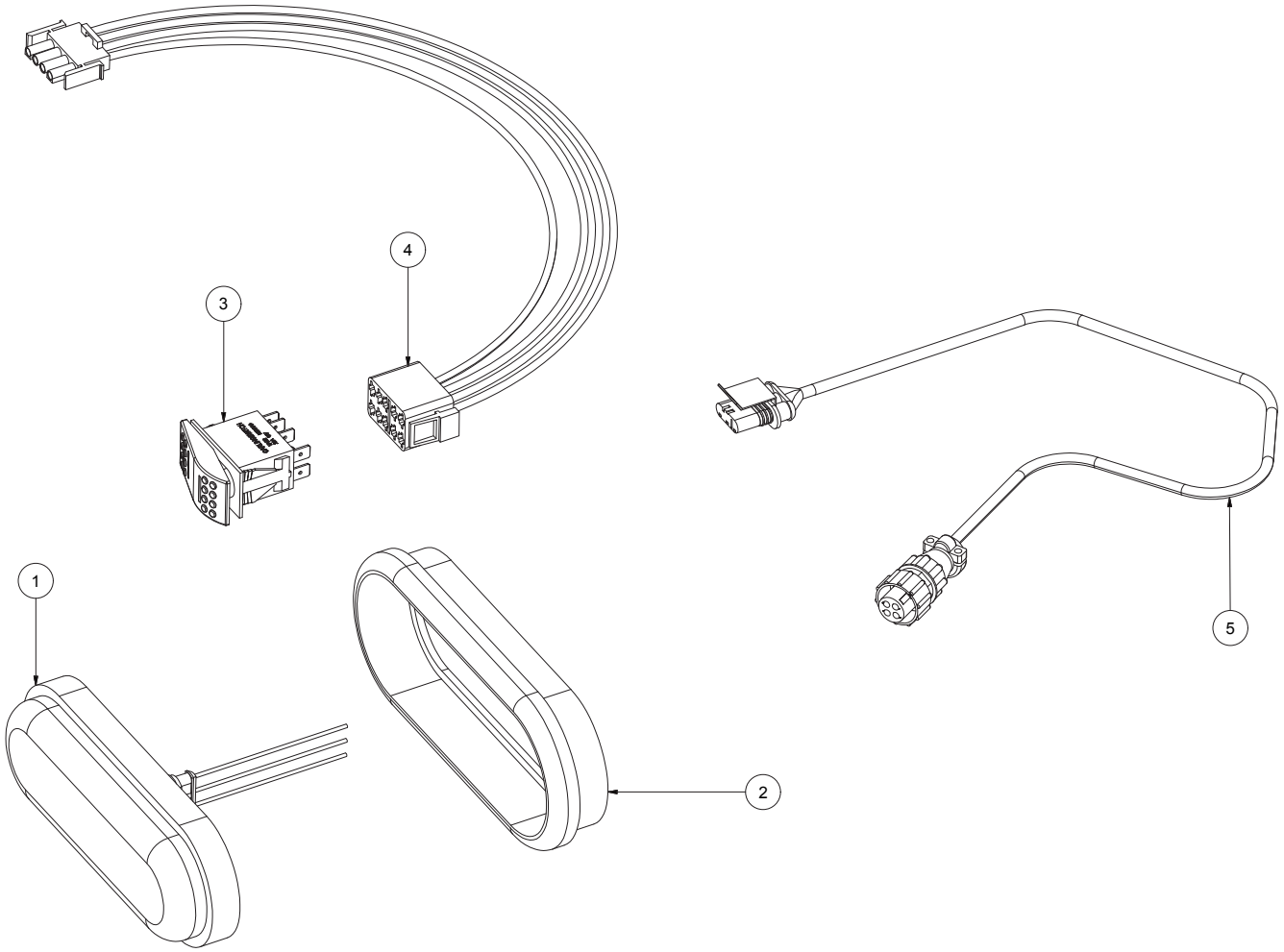
# 6.2 Air Cleaner Group

Approx. 08/96 and after




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1 | UU-G080023 | Air Cleaner Assembly |
| 2 | ... P18105.4 | ... Filter Element |
| 3 | ... P003951 | ... Clamp |
| 4 | ... P102980 | ... Rubber Baffle |
| 5 | ... P103113 | ... Dust Cap |
| 6 | ... P101870 | ... Wing Nut |
| 7 | STD.2704 | Rubber Elbow |
| 8 | P004307 | Mounting Bands (to sheet metal) |
| 9 | H001249 | Pre-Cleaner |
| 10 | ... P020648 | ... Bowl Cover |
| 11 | ... P020227 | ... Bowl |

# 6.3 Strobe Light Parts Group

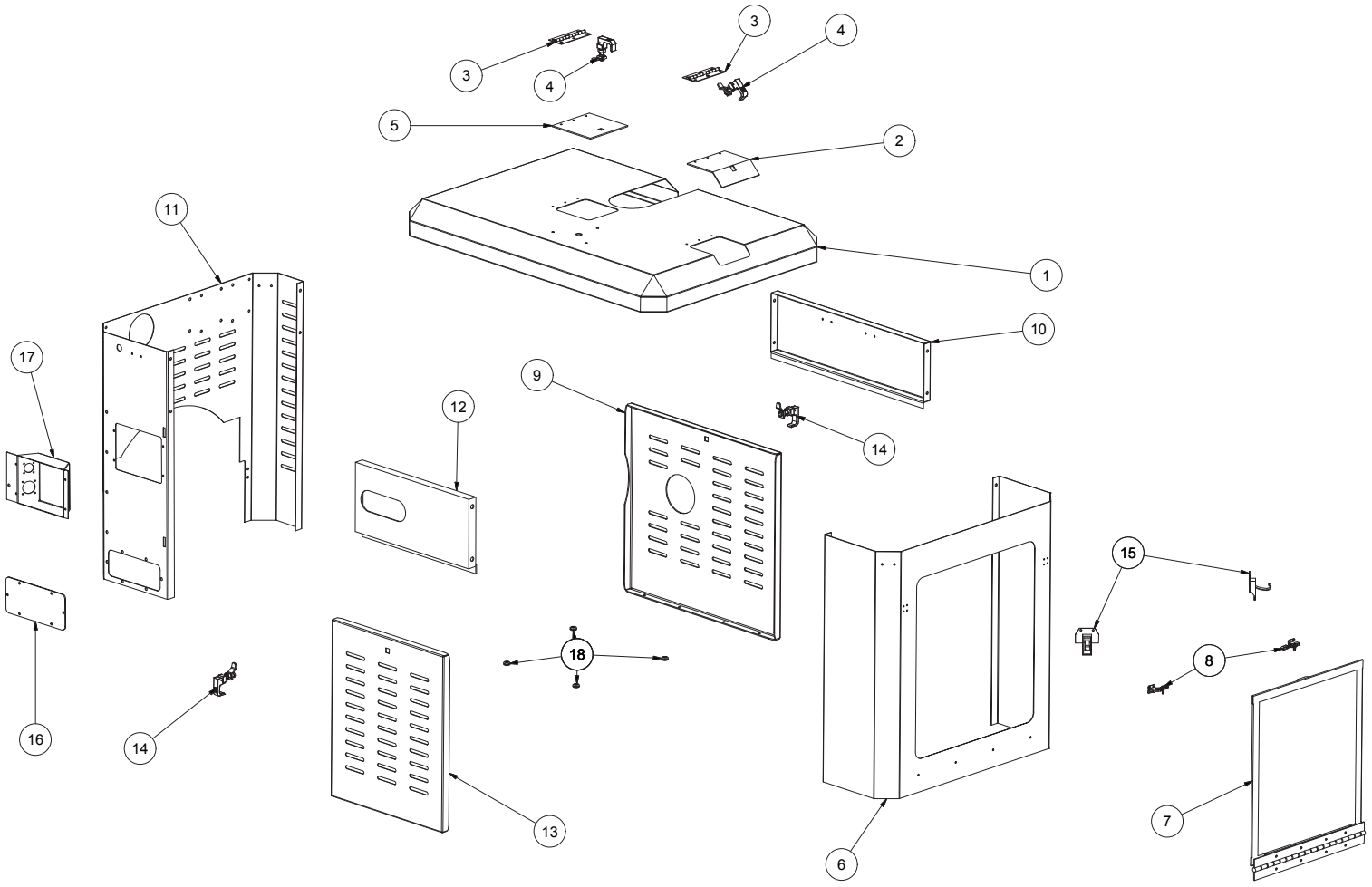



| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1 | STD.2213 | LED Strobe Light |
| 2 | 60700 | Grommett |
| 3 | 4045.0021B1 | Rocker Switch |
| 4 | 4045.0024B | Switch Wiring Harness |
| 5 | STD.2214 | Wiring Harness, rocker switch to light. |

NOTE: 01/01/04 we changed to a new style strobe light that has an internal flash module, thus a separte flash module is not needed.

# 6.4 Sheet Metal Group

John Deere 4045T and 6068D June 2005 and after

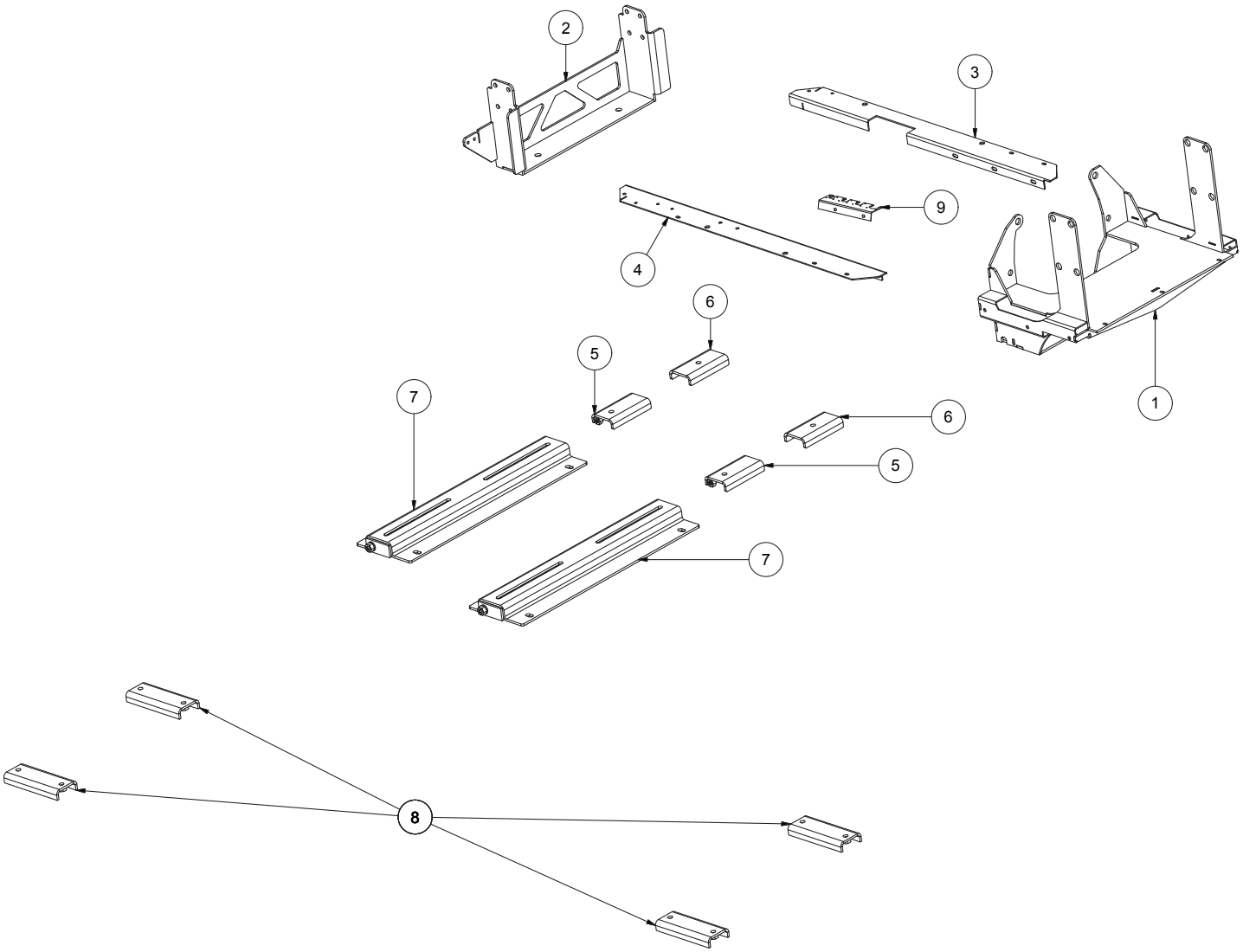



| ITEM# | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | 4045T.2102<br>4045T.2102S | Hood, not SCL<br>Hood, SCL800, JD TURBO |
| 2 | 4045.2102A | Radiator Access Door |
| 3 | 4045.2102C | Radiator Access Door Hinge |
| 4 | LCT60.624A | Lift and Turn Latch |
| 5 | 4045.2102B | Oil Fill Access Door |
| 6 | 4045.2101 | Front Panel |
| 7 | 4045.0018 | Radiator Screen |
| 8 | LCT650.114 | Radiator Screen Clamp |
| 9 | 4045.2109 | Panel Door, LH |

| ITEM# | PART NO. | DESCRIPTION |
|---|---|---|
| 10 | 4045.2106A | Upper Side Panel, LH |
| 11 | 4045.2112C<br>4045.2112T | Rear Panel, NOT SCL<br>Rear Panel, SCL |
| 12 | 4045.2105A | Upper Side Panel, RH |
| 13 | 4045.2108 | Panel Door, RH |
| 14 | LCT60.624 | Lift and Turn Latch |
| 15 | LCT609.602 | Overcenter Latch |
| 16 | 4045.2112F | Cover, Solenoid |
| 17 | STD.6304 | Wiring Plug Bracket |
| 18 | 2856.26012 | Door Grommet |

# 6.5 Engine Mount Group

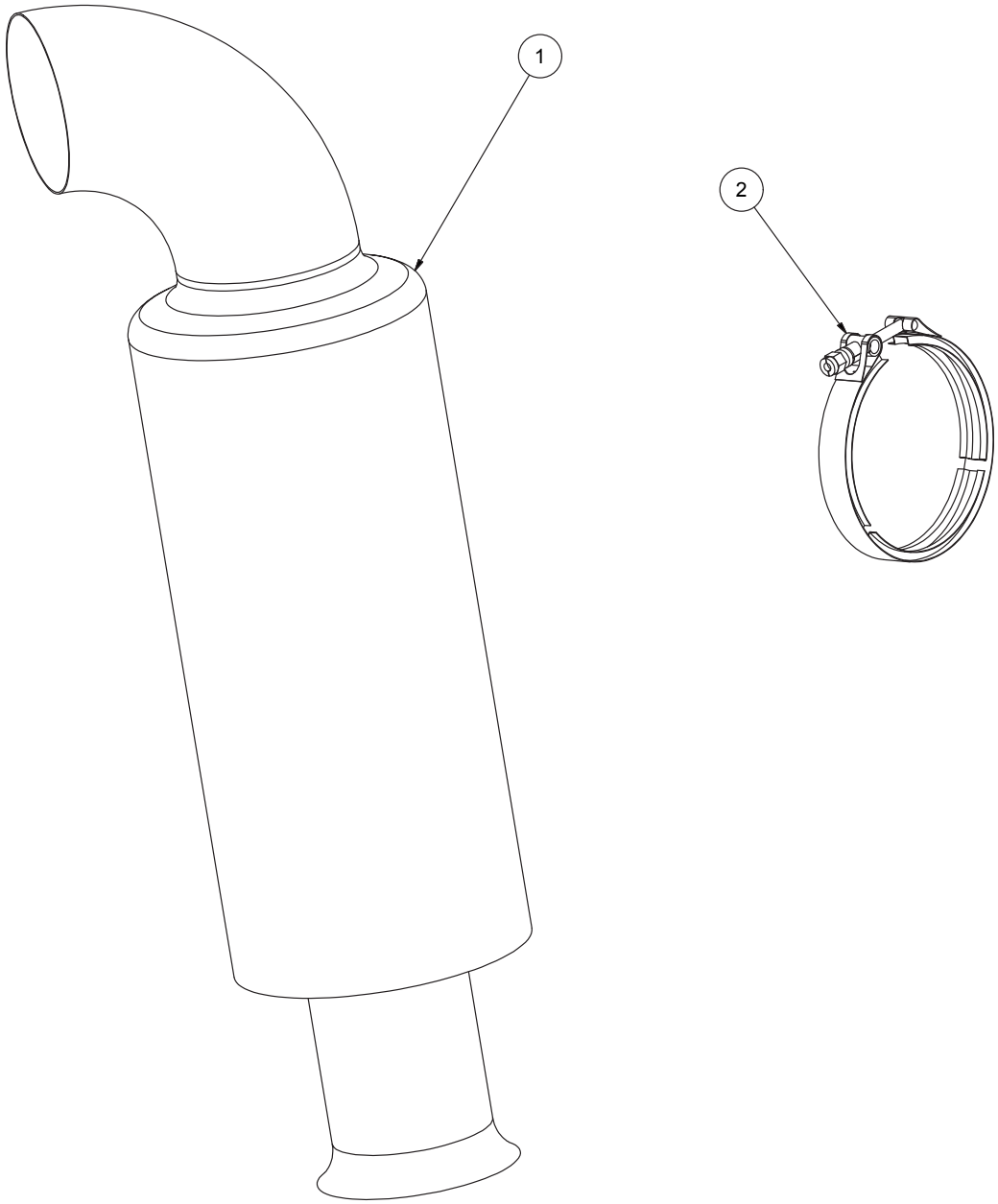
John Deere 4045D, 4045T and 6068D after 08/96




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1 | 4045.2151A | Engine Mount, Front |
| 2 | 4045.2152 | Engine Mount, Rear |
| 3 | 4045.2154 | Side Rail, LH, except LCT650 |
| 4 | 4045.2153 | Side Rail, RH |
| 5 | LCT604.603.1 | Engine Adjuster Nut |
| 6 | LCT604.603.2 | Engine Adjuster Bracket |
| 7 | LCT604.603.2 | Adjustable Motor Mount |
| 8 | LCT604.603.B | Engine Base Adjuster |
| 9 | 4045.2155 | Wiring Harness Bracket |

# 6.6 Muffler (Exhaust) Assembly

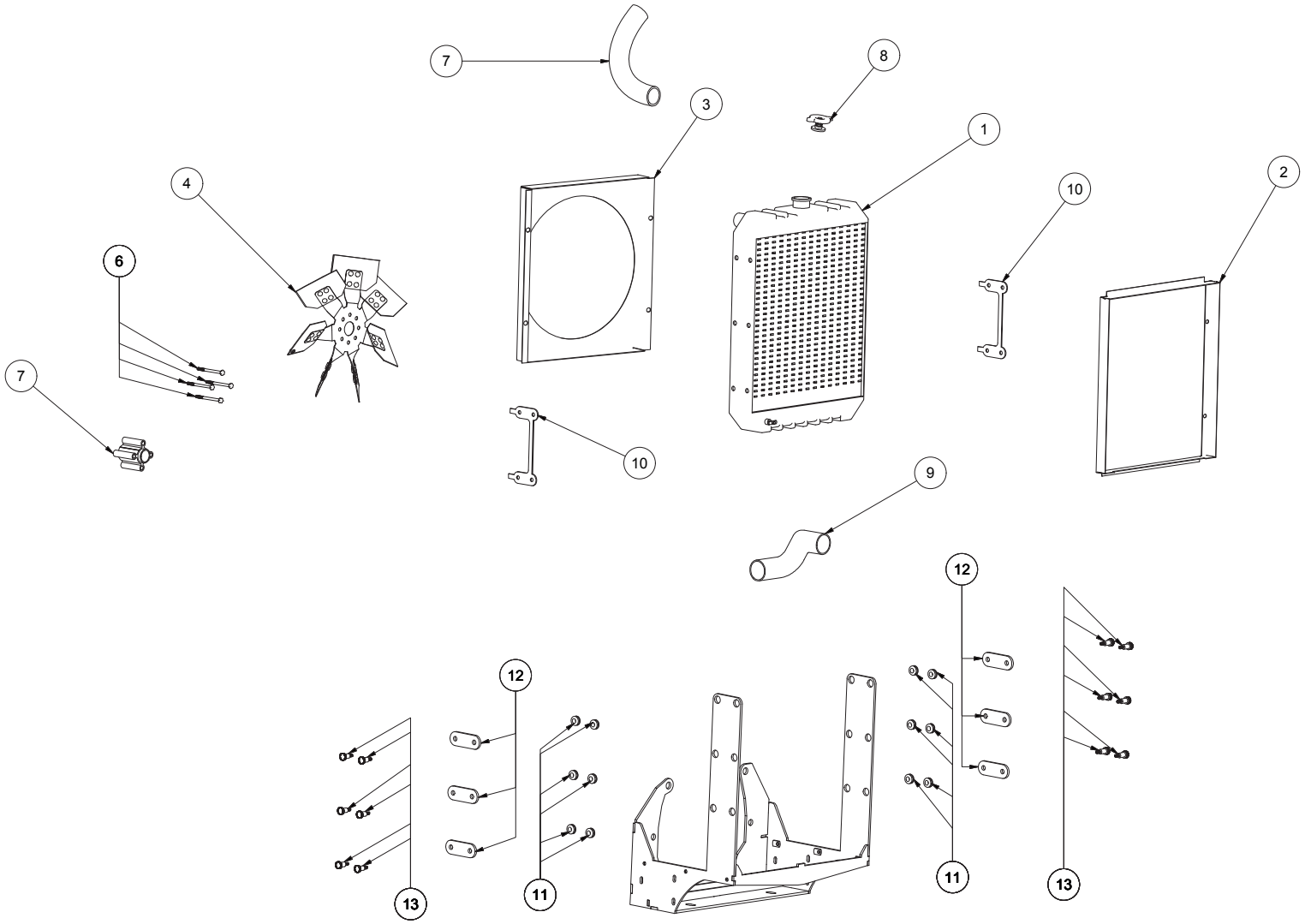
LCT's only with John Deere engines (not SCL's) May 2004 and after




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1. | 650.2701 | Muffler |
| 2. | STD.2702 | Clamp, muffler |

# 6.7 Radiator Assembly Group

John Deere after August 1996

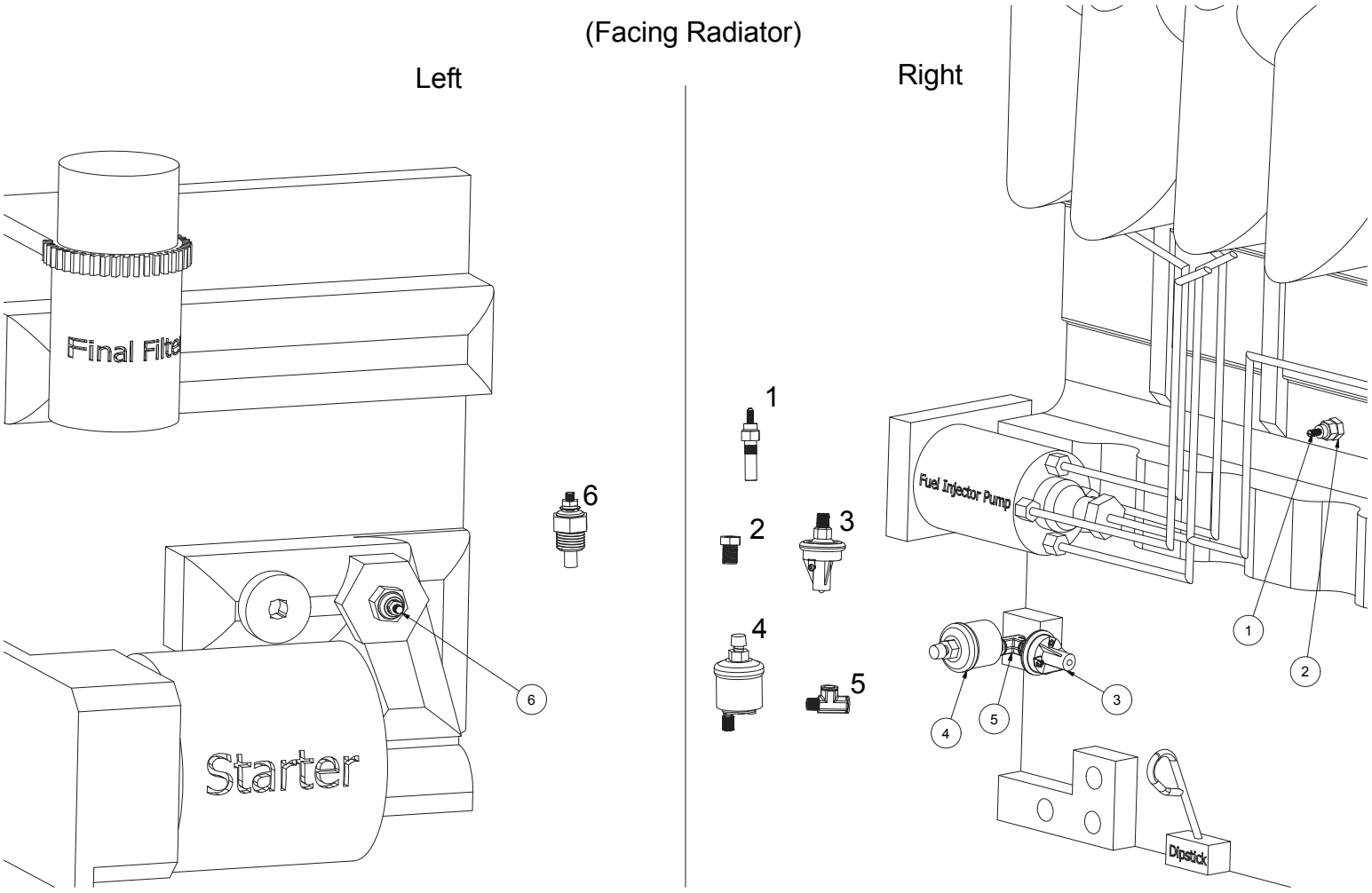



| ITEM# | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | 4045.9503A | Radiator |
| 2 | 4045.2190B | Front Fan Shroud |
| 3 | 4045.2190A | Rear Fan Shroud |
| 4 | AT35158.A | Radiator Fan |
| 5 | R128443 | Fan Spacer |
| 6 | G8M8X090 | Spacer Bolts, 4 required |
| 7 | 81331 | Upper Radiator Hose |

| ITEM# | PART NO. | DESCRIPTION |
|---|---|---|
| 8 | C.89C.022.5010 | Radiator Cap |
| 9 | 4045.9681 | Lower Radiator Hose |
| 10 | 4045.2151E | Radiator Shim |
| 11 | H9601 | Radiator Grommet |
| 12 | 4045.2151F | Radiator Bolt Bracket |
| 13 | ZSB.500.750 | Shoulder Bolt |

# 6.8 Engine Senders / Switch Group

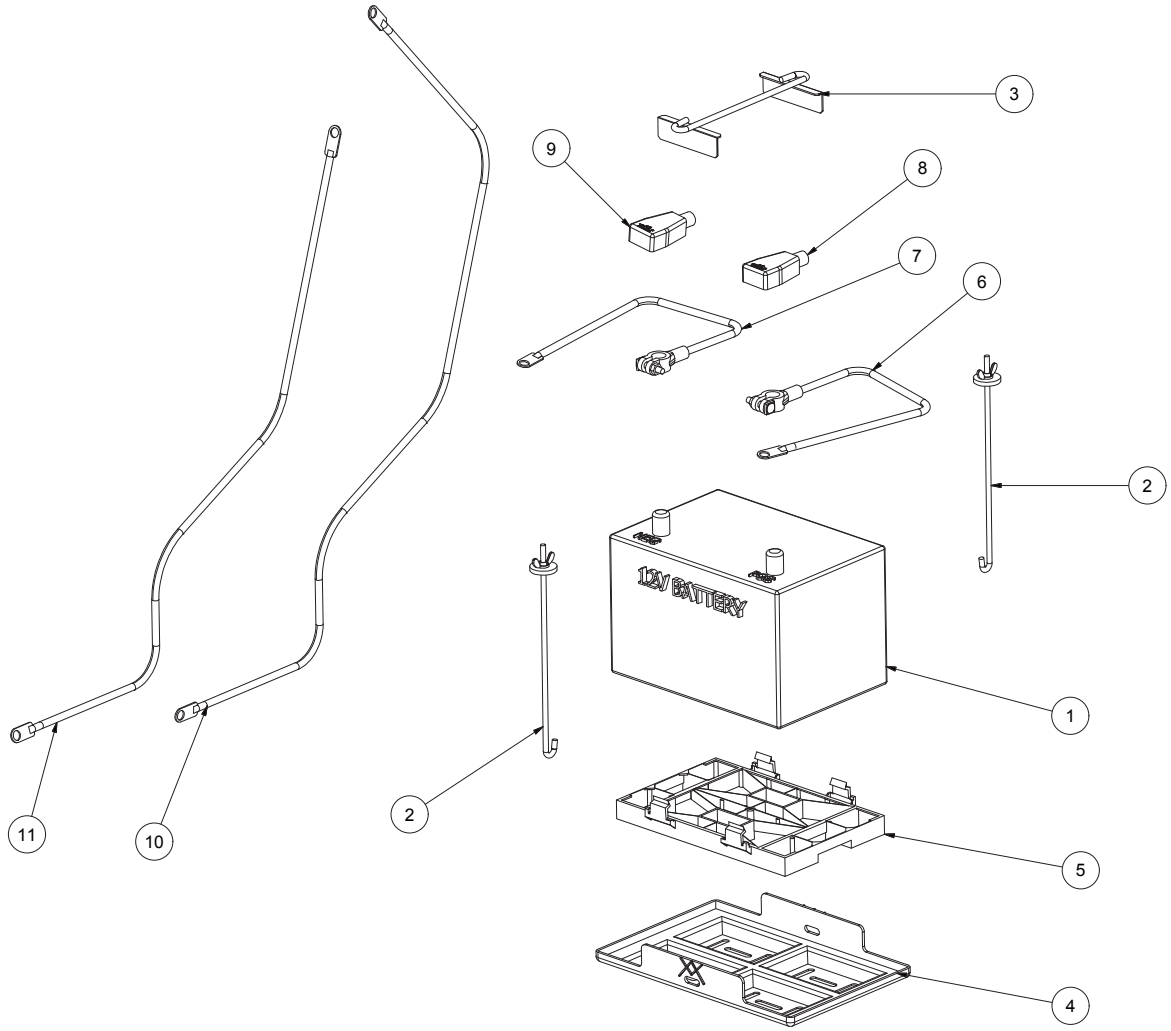
John Deere Engines




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1. | 35423.049 | Water Temperature Switch |
| 2. | C5104.4.2 | Fitting for Water Temperature Switch |
| 3. | 9603273 | Oil Pressure Switch |
| 4. | 1500171 | Oil Pressure Sender |
| 5. | 3750.2* | Bushing for Oil Pressure Switch and Sender |
| 6. | 52320.009 | Water Temperature Sender |

# 6.9 Battery Group

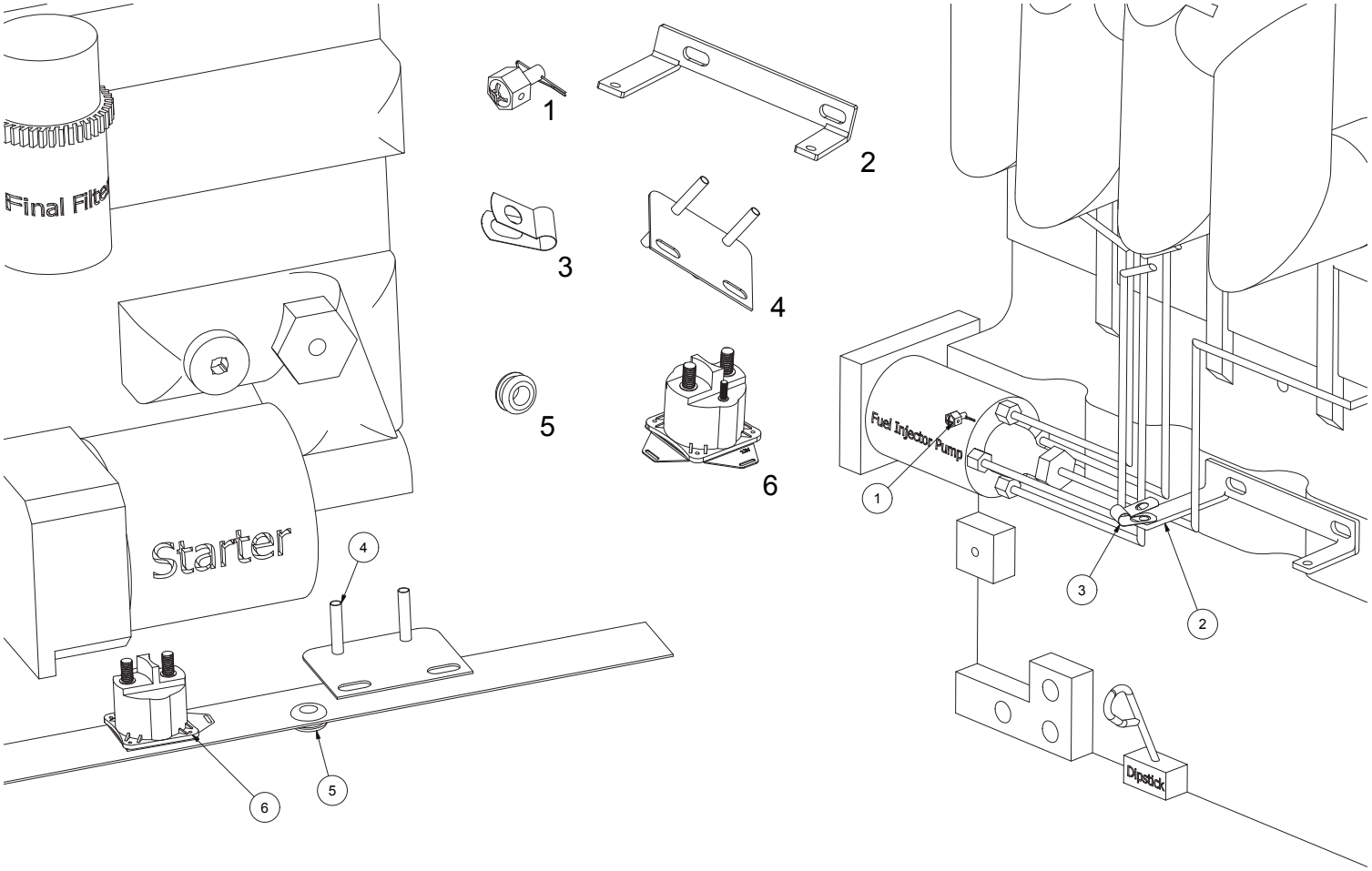
Standard units 2001 and after




| ITEM # | PART # | DESCRIPTION |
|---|---|---|
| 1. | STD.2200 | Battery, not shippable |
| 2. | BHB10J | J-Hook |
| 3. | BHCB | Battery Hold Down Bar |
| 4. | BTS1 | Battery Tray, all but SCL's |
| 5. | N/A | N/A |
| 6. | SCL.42B | Positive Battery Cable, Battery to Solenoid - LCT60C/650- 42" long |
| | LCT600.84B | Positive Battery Cable, Battery to Solenoid - LCT600/6000 - 84" long |
| 7. | LCT60.15B | Negative Battery Cable, all - 15" long |
| 8. | BTC.R | Terminal Cover, Red, all |
| 9. | BTC | Terminal Cover, Black, all |
| 10. | LCT600.72SS<br>MET.60SS<br>LCT60C.153SS | Red Cable to Hydraulic Boom Pump, SCL/600/6000 - 72" long<br>Red Cable to Hydraulic Boom Pump, LCT650, 60" long<br>Red Cable to Hydraulic Boom Pump, LCT60C, 153" long |
| 11. | LCT600.24SS | Ground (Black) Cable to Chassis, 600/6000/60C - 24" |

# 6.10 Engine Miscelleous Parts Group

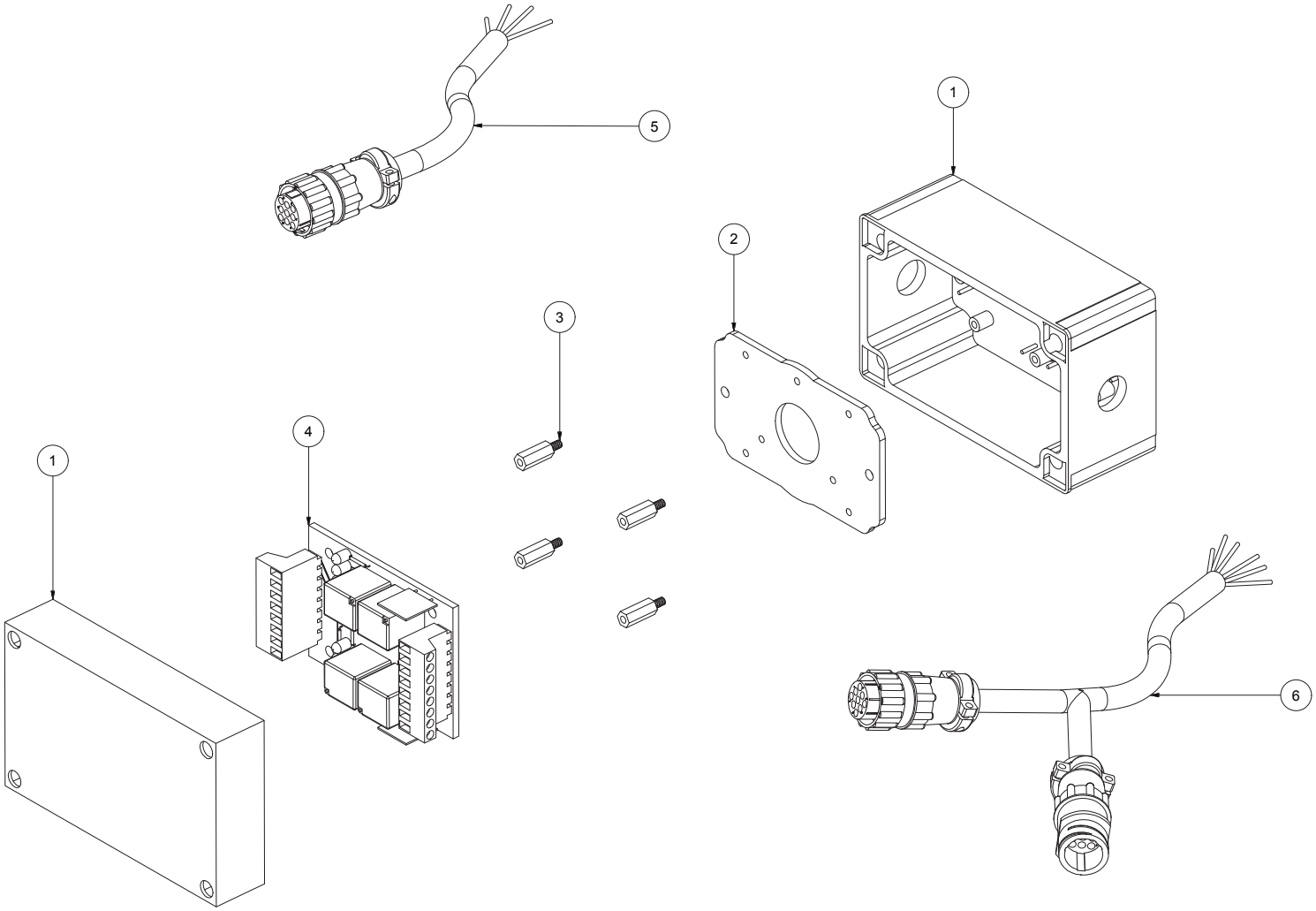
John Deere Engines




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1 | 39011.2 | Throttle Connector |
| 2 | 4045.9101 | Throttle Cable Bracket, LCT |
| 3 | 4045T.9101A | Throttle Cable Clamp |
| 4 | 400016 | Fuel Line Bracket |
| 5 | 2856.26012 | Grommet - Door |
| 6 | ST40 | Starter Solenoid |

# 6.11 Remote Clutch / Throttle Circuit Board Assembly

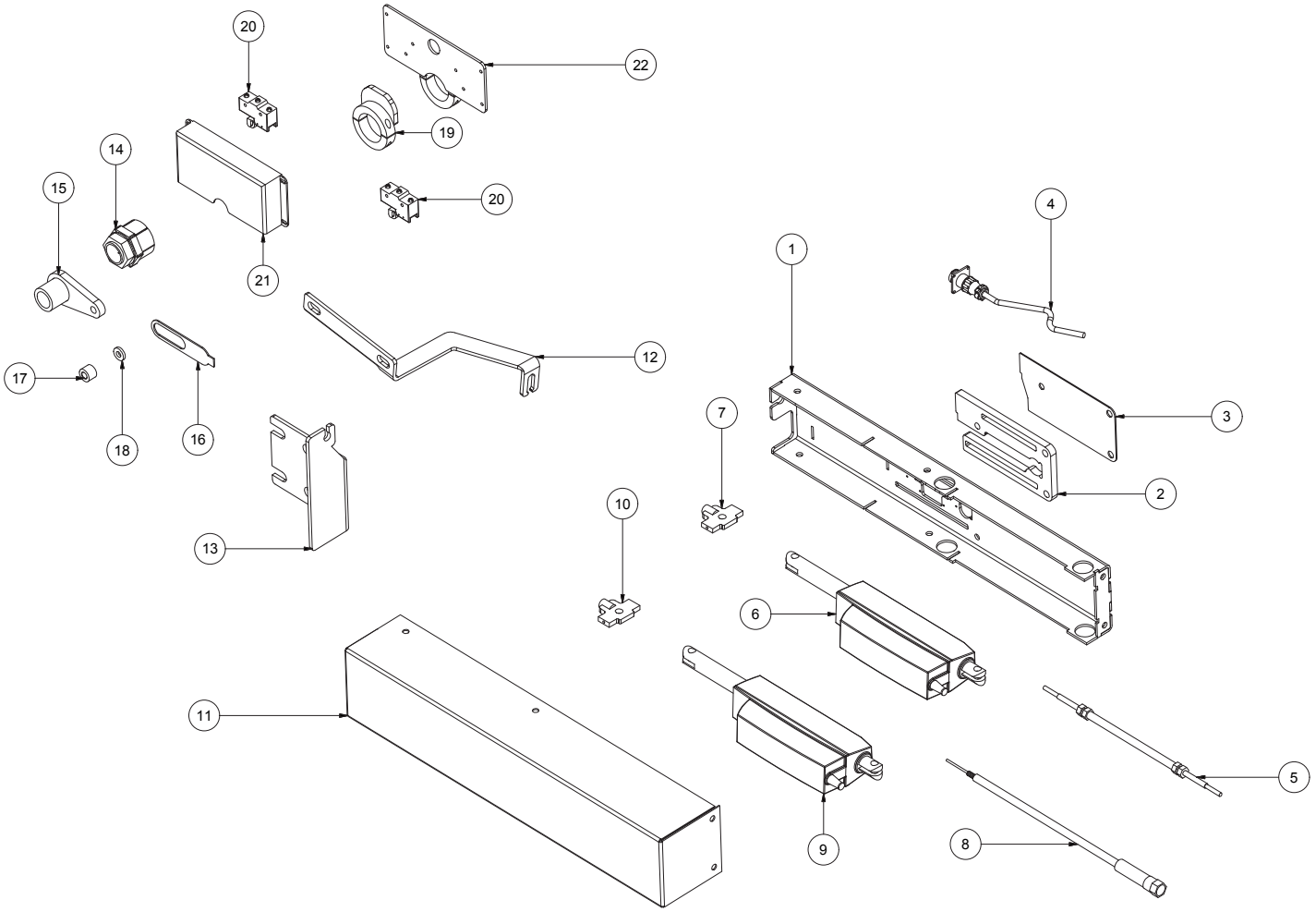
October 2005 and after with remote throttle / clutch option




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| * | STD.3000 | Entire Assembly |
| 1 | only available as an assembly | Box and Cover |
| 2 | only available as an assembly | Backing Plate |
| 3 | only available as an assembly | Spacer, rquires 4 |
| 4 | only available as an assembly | Circuit Board |
| 5 | only available as an assembly | Actuator Wiring Harness |
| 6 | only available as an assembly | Instrument Panel and Nozzle Wiring Harness |

# 6.12 Remote Clutch and Remote Throttle Assembly

after March 2002- ver. 2




| ITEM # | PART NO. | DESCRIPTION |
|---|---|---|
| | STD.6550B | Entire Assembly1 |
| 1 | STD.6551A | Mounting Base |
| 2 | STD.6551A.01 | Thick Spacer |
| 3 | STD.6551A.02 | Thin Spacer |
| 4 | STD.6566 | Wiring Harness |
| 5 | STD.6554<br>STD.6554B | Clutch Cable - Direct Drive<br>Clutch Cable - Belt Drive |
| 6 | STD.6556 | Clutch Actuator (top) |
| 7 | STD.6559 | Cable Adaptor - clutch |
| 8 | STD.6553<br>STD.6553B | Throttle Cable - direct drive<br>Throttle Cable - belt drive |
| 9 | STD.6557 | Throttle Acutator (bottom) |
| 10 | STD.6558 | Cable Adaptor-throttle |

| ITEM # | PART NO. | DESCRIPTION |
|---|---|---|
| 11 | STD.6552A | Cover |
| 12 | 4045.6565 | Throttle Cable Bracket |
| 13 | 4045.6564 | Clutch Cable Bracket |
| 14 | STD.6563 | Torque Coupling |
| 15 | STD.6562 | Coupling Sleeve |
| 16 | STD.6560 | PTO Cable Adaptor |
| 17 | STD.6561 | Roller Bearing |
| 18 | STD.6568 | Spacer Washer |
| 19 | STD.6569 | Collar Cam (3x only) |
| 20 | 800.434 | Limit Switch (3x only) |
| 21 | STD.6571 | Cover |
| 22 | STD.6570 | Limit Switch Bracket |

7-0

# 7.0 CLUTCH GROUP


- 7.1 AutoHD PTO Clutch Group
- 7.2 AutoHD PTO Assembly Group
- 7.3 AutoHD PTO Linkage Group
- 7.4 Clutch Assist Group
- 7.5 Kraft Fluid Drive Group (Optional)
- 7.6 Kraft Fluid Drive Installation (Optional)
- 7.7 Kraft Fluid Drive Breakdown (Optional)
- 7.8 Kraft Fluid Drive Common Parts (Optional)



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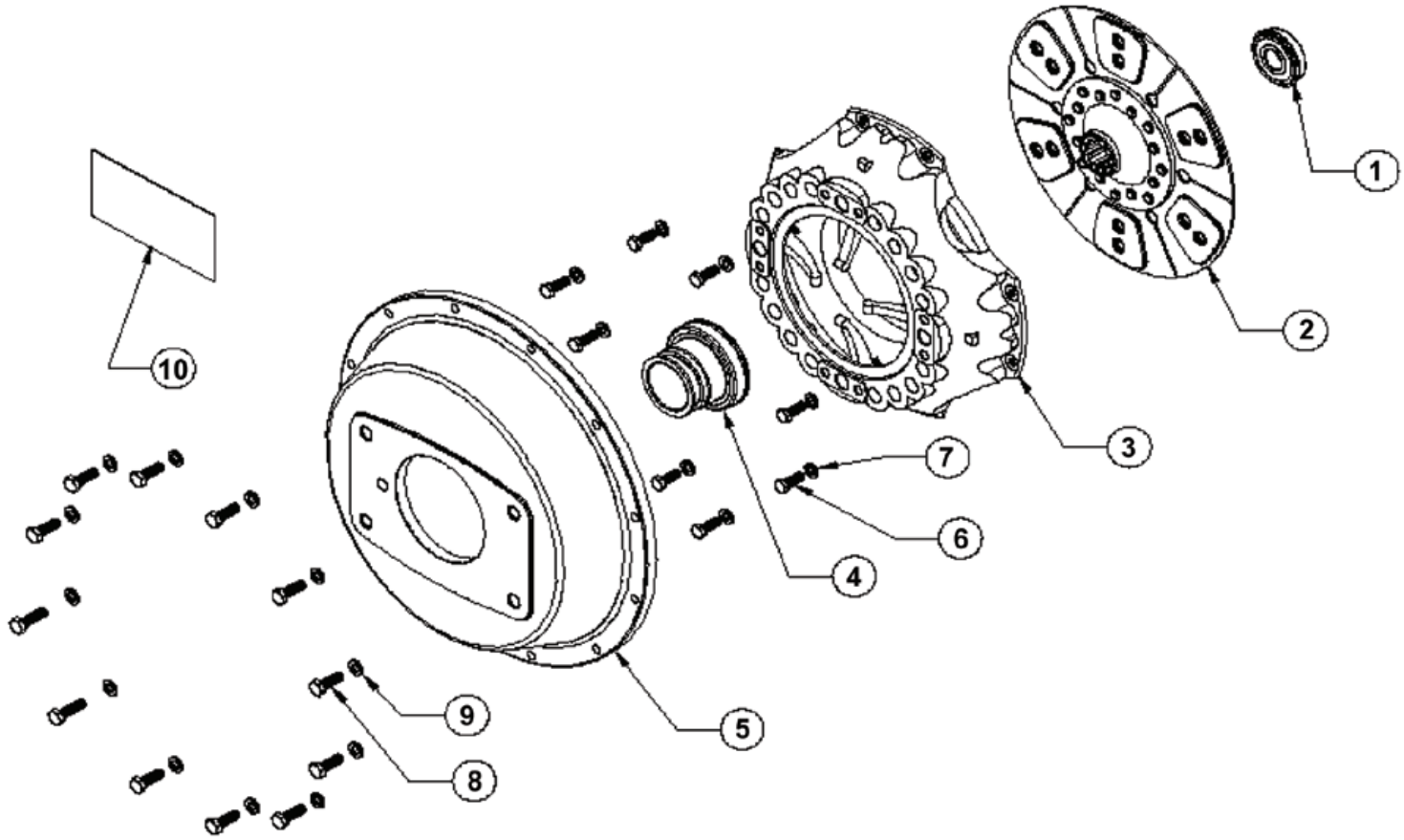
# 7.1 AutoHD PTO Clutch Group

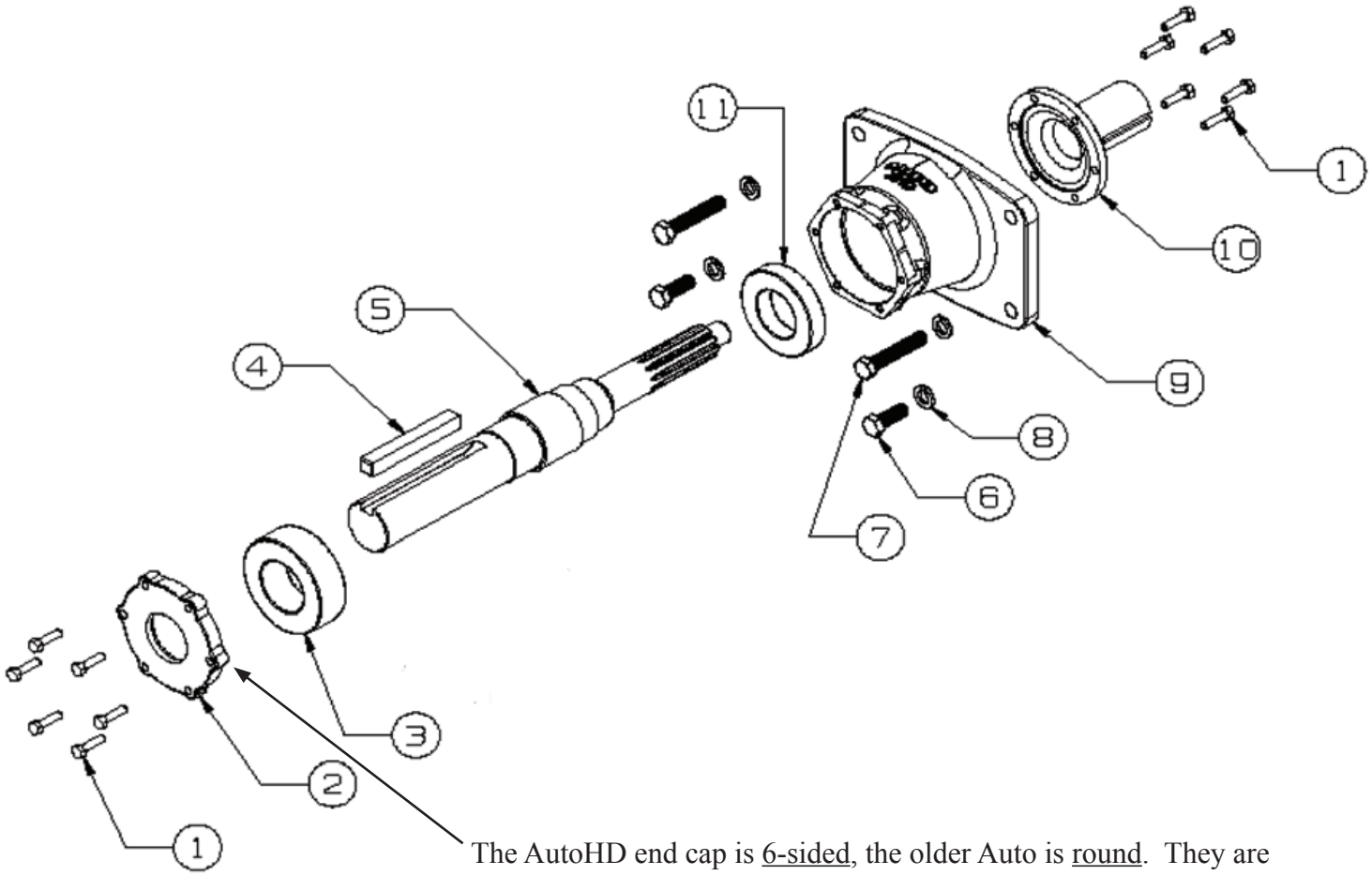
February 2006 - Present




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| * | OD-48080050.8OF | *Complete PTO and Clutch Assembly 03/08 - |
| 1 | OD-41500217 | Pilot Bearing, JD |
| 2 | OD-41500237 | Clutch Disk |
| 3 | OD-361919 | Pressure Plate, 03/08 - |
| 4 | OD-41500248 | Throw out Bearing,03/08 - |
| 5 | OD-41500172 | Clutch Cover |
| 6 | OD-45000054 | Bolt, 3/18-16 x 1" |
| 7 | OD-45000063 | Lock Washer, 3/8" |
| 8 | OD-45000226 | Bolt, M10-1.50 x 35MM |
| 9 | OD-45000046 | Lock Washer, M10 |
| 10 | OD-41500216 | Decal, Diesel Clutch |

# 7.2 AutoHD PTO Assembly Group

March 2008 - Present

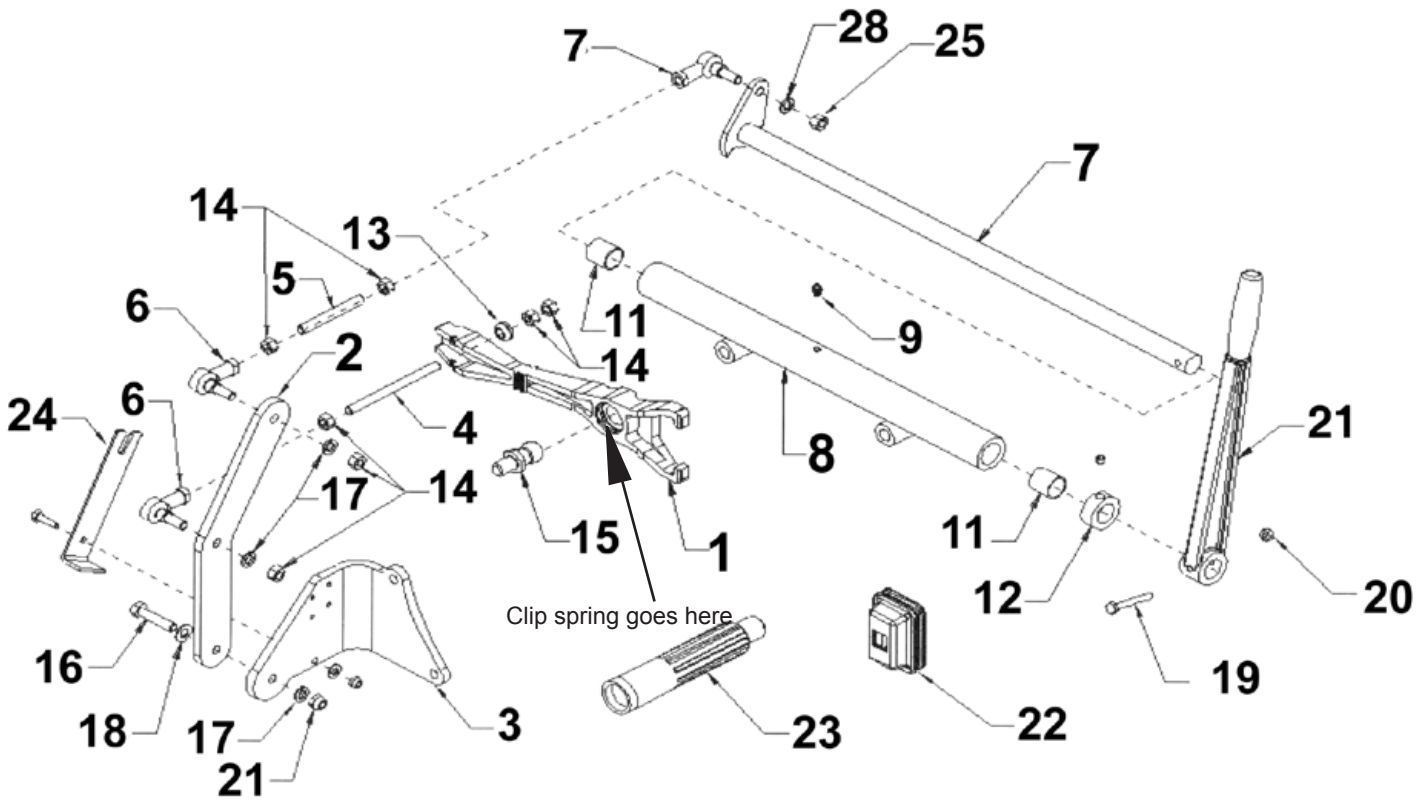



The AutoHD end cap is 6-sided, the older Auto is round. They are not interchangeable! Some units in the time period above used the standard Auto PTO. Please verify.

| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| * | OD-41500252 | Complete PTO Assembly (items 1 -11,13) |
| ** | OD-48080050.8OF | **Complete PTO & Clutch Assembly |
| 1 | OD-45000212 | Bolt, 5/16-18 x 1-1/4" HD model |
| 2 | OD-41500205M | Bearing Retainer Cover |
| 3 | OD-41500206 | PTO Bearing, Rear |
| 4 | OD-LCT650.601K<br>OD-LCT650.601F | Key, Stepdown--direct drive units only<br>Key, belt drive units only |
| 5 | OD-41500203 | PTO shaft |
| 6 | OD-45000105 | Bolt, 9/16-12 x 1- 3/4" |
| 7 | OD-45000177 | Bolt, 9/16-12 x 3" |
| 8 | OD-45000103 | Lock Washer, 9/16" |
| 9 | OD-41500204 | PTO Housing |
| 10 | OD-41500242 | PTO Collar, 03/08 - present |
| 11 | OD-41500207 | PTO Bearing, Front |

# 7.3 AutoHD PTO Linkage Group

March 2008 - Present

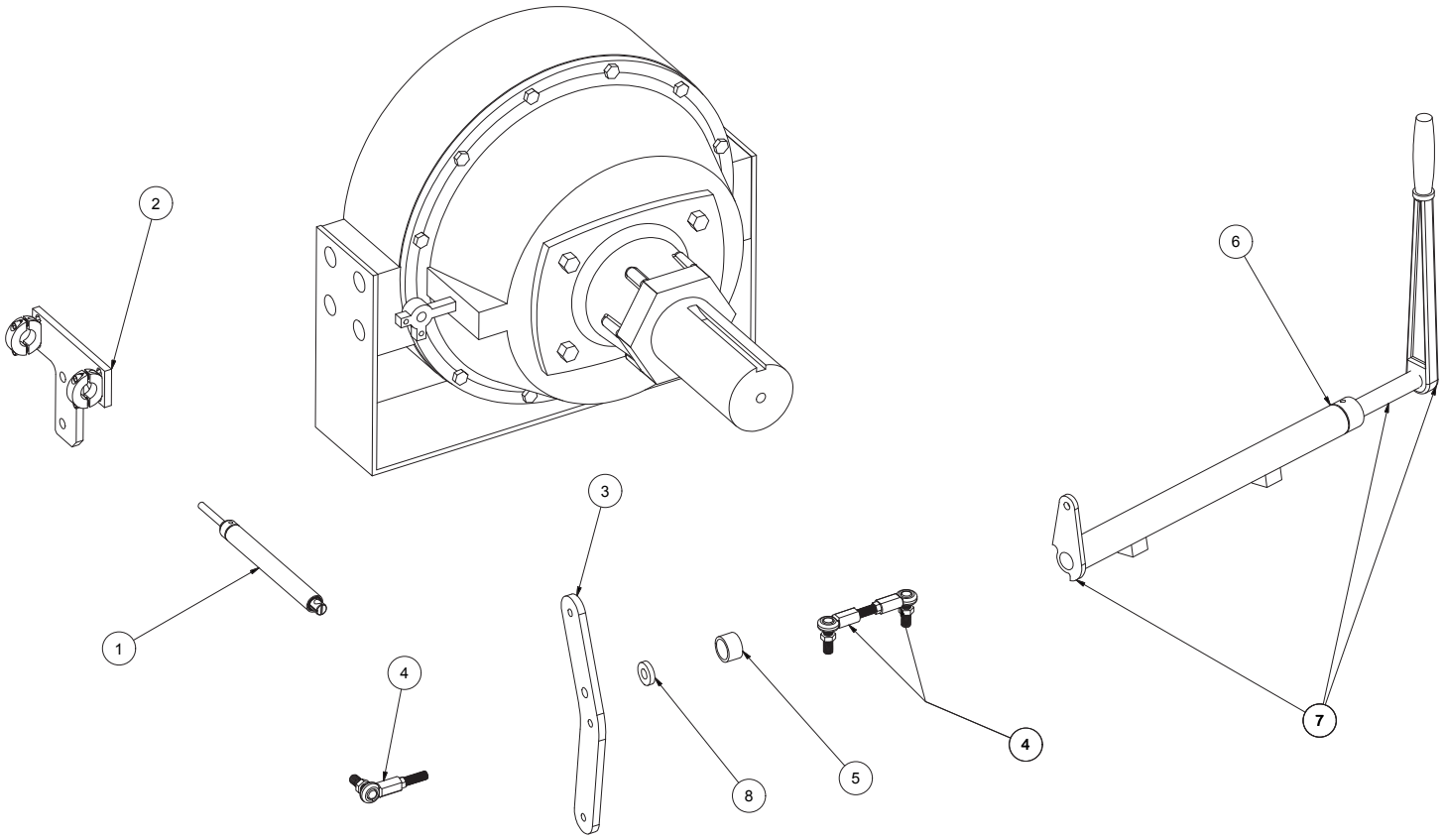



| ITEM # | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | 41500251 | Fork, 03/08- |
| NS | 41500174 | Clip Spring in Fork |
| NS | 41500999 | Return Spring |
| 2 | 41500095 | Linkage Bracket |
| 3 | 41500241 | Linkage Bracket |
| 4 | 41500065 | Linkage Rod |
| 5 | 41500066 | Linkage Rod |
| 6 | 41500019 | Linkage Rod End |
| 7 | see below | Shaft, Lever |
| 8 | 41500102 | Shaft Housing, AutoHD |
| 9 | 41500043 | Grease Zerk |
| 10 | NLA | NLA |

| ITEM # | PART NO. | DESCRIPTION |
|---|---|---|
| 11 | 41500045 | Shaft Bushing |
| 12 | 41500046 | Shaft Collar |
| 13 | 41500030 | Rocker Ball |
| 14 | 45000050 | Nut, 3/8 - 16 |
| 15 | 41500072 | Pivot Ball 03/08- |
| 16 | 45000177 | Bolt, 3/8 - 16 x 1 3/4" |
| 17 | 45000063 | Lock Washer, 3/8" |
| 18 | 45000064 | Flat Washer, 3/8" |
| 19 | 45000012 | Bolt, 1/4 - 28 x 2" |
| 20 | 45000015 | Locknut, 1/4 - 28 |
| 21 | 45000044 | Handle |
| 22 | 45000175 | Boot |
| 23 | 41500164 | Alignment Tool |
| 24 | 41500103 | Alignment Tool |

# 7.4 Clutch Assist Group

Auto PTO- John Deere 4045D/T (11/00 - )




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1 | 400050.A | Clutch Cylinder |
| 2 | 400054.C | Cylinder Support Bracket, JD |
| 3 | 41500095 | Clutch Bracket Arm, Auto HD |
| 4 | 41500019 | Linkage, Rod end |
| | 41500019A | Linkage, Threaded insert |
| 5 | 400050.C1 | Bearing |
| 6 | 41500102 | Pivot Shaft Tube, Auto HD |
| 7 | 41500041A.HD | Pivot Shaft, |
| 8 | 400050.C2 | Spacer |

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## INSTALLATION AND MAINTENANCE MANUAL

*THIS MANUAL CONTAINS INSTRUCTIONS FOR INSTALLATION, START UP, FUNCTIONING, AND MAINTENANCE KFBD POWER TAKE OFFS.*
***WE SUGGEST THAT ANY PERSON WHO IS RESPONSIBLE FOR USE AND/OR MAINTENANCE SHOULD BE PROVIDED WITH THIS MANUAL. THE RESPECT OF RULES, CONTAINED IN THIS MANUAL IS MANDATORY FOR WARRENTY VALIDITY.***
*WE REQUIRE THAT, FOR SPARE PARTS ORDERS, IT IS IMPORTANT TO PROVIDE, BESIDES PART NUMBER AND QUANTITY: MODEL, SPECIFICATION No AND SERIAL No WHICH ARE STAMPED ON NAME PLATE.*

**Type :** 13KFBD

**Spec. nr. :** 2248__ __

**Serial nr. :**

13KFBD

drive with us

| TRANSFLUID trasmissioni industriali | 13 KFBD<br>MANUALE INSTALLAZIONE, USO E MANUTENZIONE<br>*INSTALLATION,USE AND MAINTENANCE MANUAL* | TF 6217<br>Rev.0<br>1/3 |
|---|---|---|

Questo manuale contiene le istruzioni per l'installazione, l'avviamento, l'uso e la manutenzione del giunto idrodinamico tipo KFBD.
**CONSIGLIAMO CHE I RESPONSABILI DELL'USO E DELLA MANUTENZIONE DEL KFBD, VENGANO DOTATI DEL PRESENTE MANUALE. IL NON RISPETTO DELLE REGOLE CITATE IN QUESTO MANUALE, PROVOCA IL DECADERE DELLA GARANZIA.**
Ricordiamo che, per ordinare le parti di ricambio, e' importante specificare, oltre al numero di dettaglio e quantita' richiesta, anche:
TIPO - N° di SPECiFICA - N° di SERIE del KFBD, che si trovano stampigliati sulla targhetta di identificazione a bordo macchina.

*This manual contains instructions for installation, start up, working, and maintenance of KFBD fluid coupling.*
***WE SUGGEST THAT ANY PERSON WHO IS RESPONSIBLE FOR USE AND/OR MAINTENANCE, SHOULD BE PROVIDED WITH THIS MANUAL. THE RESPECT OF RULES, CONTAINED IN THIS MANUAL, IS MANDATORY FOR WARRANTY VALIDITY.***
*We recall that, for spare parts order, it is important to provide, besides detail number and quantity, even:*
*TYPE - SPECIFICATION Nr. - SERIAL Nr. of KFBD that are stamped on identification metal plate.*

| DESCRIZIONE | *DESCRIPTION* |
|---|---|
| Il KFBD e' un giunto idrodinamico la cui parte esterna, motrice, e' collegata al volano di un motore endotermico mediante un giunto elastico ed il cui albero di uscita e' supportato da un cuscinetto orientabile a rulli, lubrificato ad olio, alloggiati in una campana di supporto flangiata al coprivolano del motore. Un secondo cuscinetto, alloggiato nel volano, sostiene l'albero di uscita dal lato motore. Il KFBD e' adatto per applicazioni con puleggia od i linea. | KFBD is a fluid coupling having the outer driving impeller connected to the internal combustion engine flywheel through an elastic coupling. The output shaft is supported by a spherical roller bearing, oil lubricated, fitted in a cover flanged to the engine flywheel housing. Another bearing, fitted into the flywheel, supports the output shaft at the engine side. The KFBD is suitable for pulley or in line applications. |

**Prima di iniziare il montaggio del KFBD sul motore, e' bene verificare che il volano rientri nelle tolleranze SAE. Questo e' importante soprattutto per il buon funzionamento del giunto elastico.(Vedere foglio 2/3 Fig.1)**

***Before KFBD be mounted onto the engine, it is recommended to check that flywheel be within SAE tolerances. This is very important for elastic coupling good working.(see sheet 2/3 Fig.1)***

| | **INSTALLAZIONE** (vedere foglio 2/3) | | *INSTALLATION (see sheet.2/3)* |
|---|---|---|---|
| 1 | Montare l'anello di trascinamento del giunto elastico sul volano del motore. | 1 | Mount elastic coupling driving ring, onto engine flywheel. |
| 2 | Montare il cuscinetto pilota, ingrassato a vita, sull'albero del KFBD. | 2 | Mount pilot bearing, greased for life, onto KFBD shaft. |
| 3 | Montare la flangia SAE 3 sul coprivolano. | 3 | Mount SAE 3 flange onto flywheel housing. |
| 4 | Posizionare il gruppo completo, osservando con cura l'allineamento dell'albero nel cuscinetto pilota e dei blocchetti del giunto elastico con l'anello di trascinamento montato sul volano. La campana esterna deve essere orientata in modo da avere l'apertura per il riempimento dell'olio a circa 60° dalla verticale, in senso orario guardando il volano del motore. Cosi' montato, si avra' l'apertura di drenaggio dell'olio in basso. Infine fissare il gruppo con le apposite viti sulla flangia esterna. | 4 | Install complete group paying attention at alignement between shaft and pilot bearing as well as alignement between rubber blocks and driving ring.<br>External housing must be orientated to get the oil fill opening at about 60° clockwise from vertical line, looking at the flywheel.<br>In such a way, the oil drain opening will be downwards. Therefore tighten screws of external flange. |
| 5 | Riempimento olio giunto (vedere tabella olii consigliati). Togliere il coperchio che protegge il tappo di carico . Ruotare il giunto sino a portare il tappo in corrispondenza del segno di riferimento X sulla verticale (X-1-2-3-4 dipende dall'applicazione). Togliere il tappo e riempire fino allo sbocco dal foro (13KFBD X=5,2 lt;), quindi chiudere utilizzando del sigillante sul filetto. La coppia di serraggio e' 30 Nm per tappo 3/8". Rimontare il coperchio di protezione. | 5 | Fluid coupling oil filling (see recommended oil table). Remove cover. Turn fluid coupling untill X mark be on vertical line (X-1-2-3-4 depends on application). Remove plug and fill untill oil overflows (13KFBD fill X=5,2 lt;). Therefore fit the plug using sealent on thread. Tightening torque is 30 Nm for 3/8" plug .Fit again the cover. |
| 6 | Riempimento grasso (vedere tabella grassi consigliati). Mediante l'apposito ingrasatore,, riempire la camera di lavoro del cuscinetto fino a far fuoriuscire il grasso attorno all'albero | 6 | Grease filling (see recommended grease table). Through the grease filler, fill grease untill it comes out around the shaft. |
| 7 | Dare alcuni colpi, con un martello non metallico, sull'estremita' dell'albero onde eliminare ogni eventuale tensione sui cuscinetti dovuta alla resistenza offerta dal cuscinetto pilota, quando esso viene montato forzato nella sede del volano. | 7 | Rap the shaft on the end to relieve any preloading that may result due to the resistance of pilot bearing when being pressed into the flywheel. |
| 8 | Al primo avviamento, far girare il gruppo innestato, per almeno 10 minuti,con il motore alla meta' dei giri massimi. | 8 | At first start up, run the unit engaged and engine at half of max speed for not less than 10 minutes. |


tf6217-1 06/04/01

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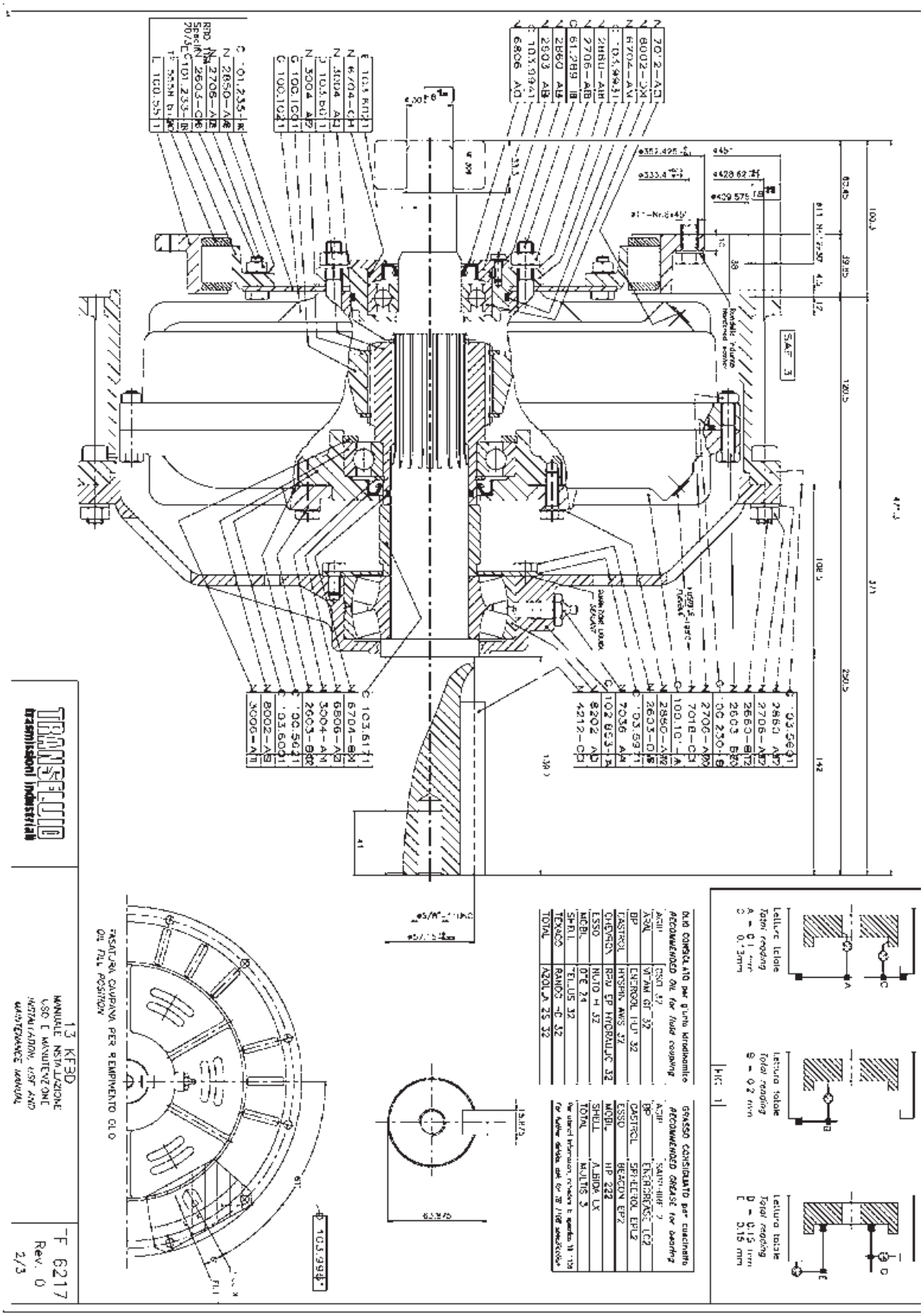
# 7.7 Kraft Fluid Drive Breakdown (Optional)

Fluid Drive Coupler (Optional)



# 7.8 Kraft Fluid Drive Common Parts (Optional)

Fluid Drive Coupler (Optional)

| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1 | UU-TFP7018CC | 390 Degree Fuse Plug, 5/8" |
| 2 | UU-TFP2292 | Seal Kit |
| 3 | UU-8202AD | Roller Bearing |
| 4 | UU-TFP103602X | Shaft |
| 5 | UU-8002DX | Bearing, small |
| 6 | UU-8002AS | Ball Bearing |
| 7 | UU-KPC2.01.5 | Fluid, 1-1/2 gallon |

8-0

# 8.0 BLOWER HOUSING GROUP

- 8.1 Blower Housing Group
- 8.2 Exhaust Duct Assembly

BLOWER HOUSING GROUP

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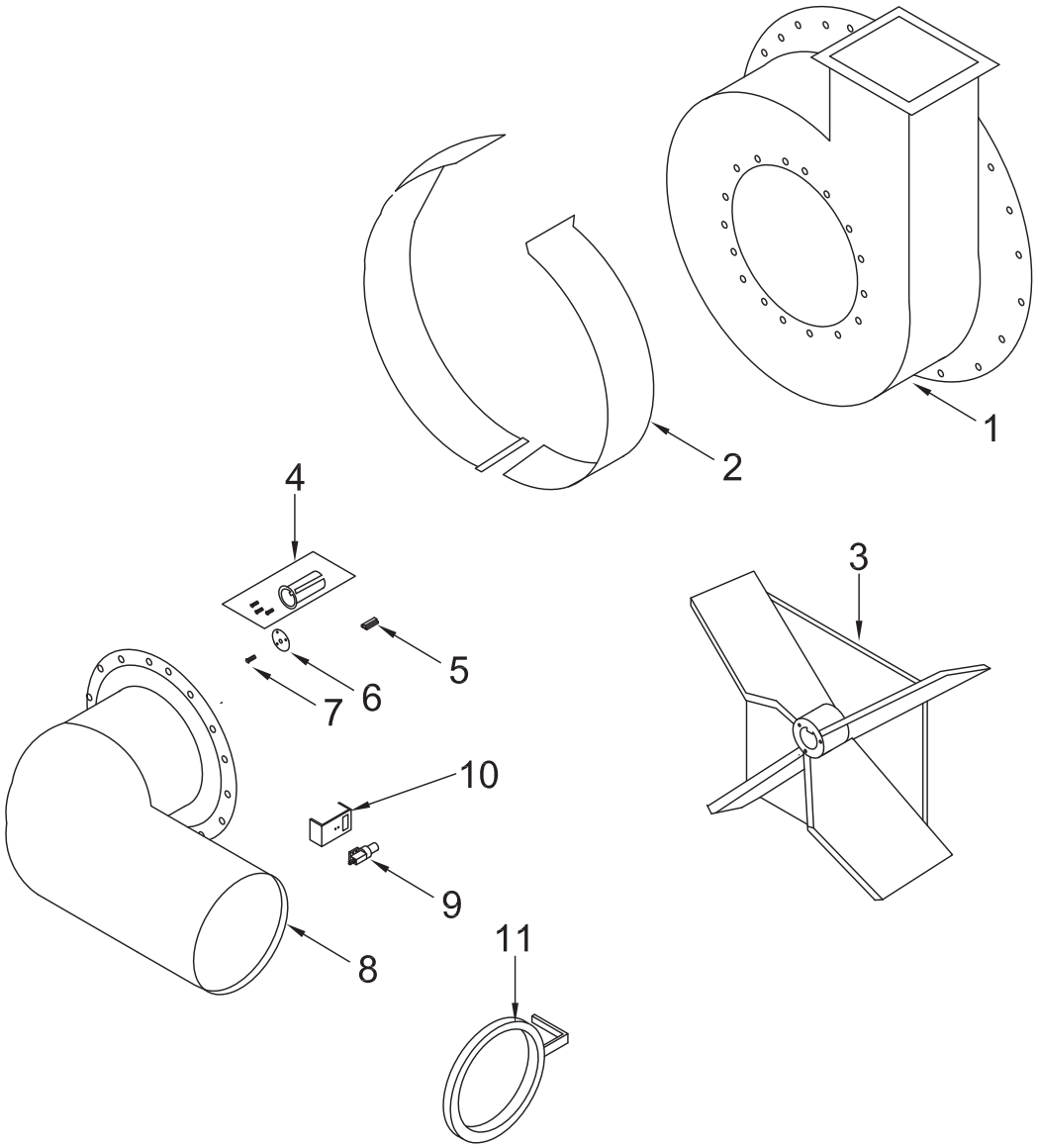
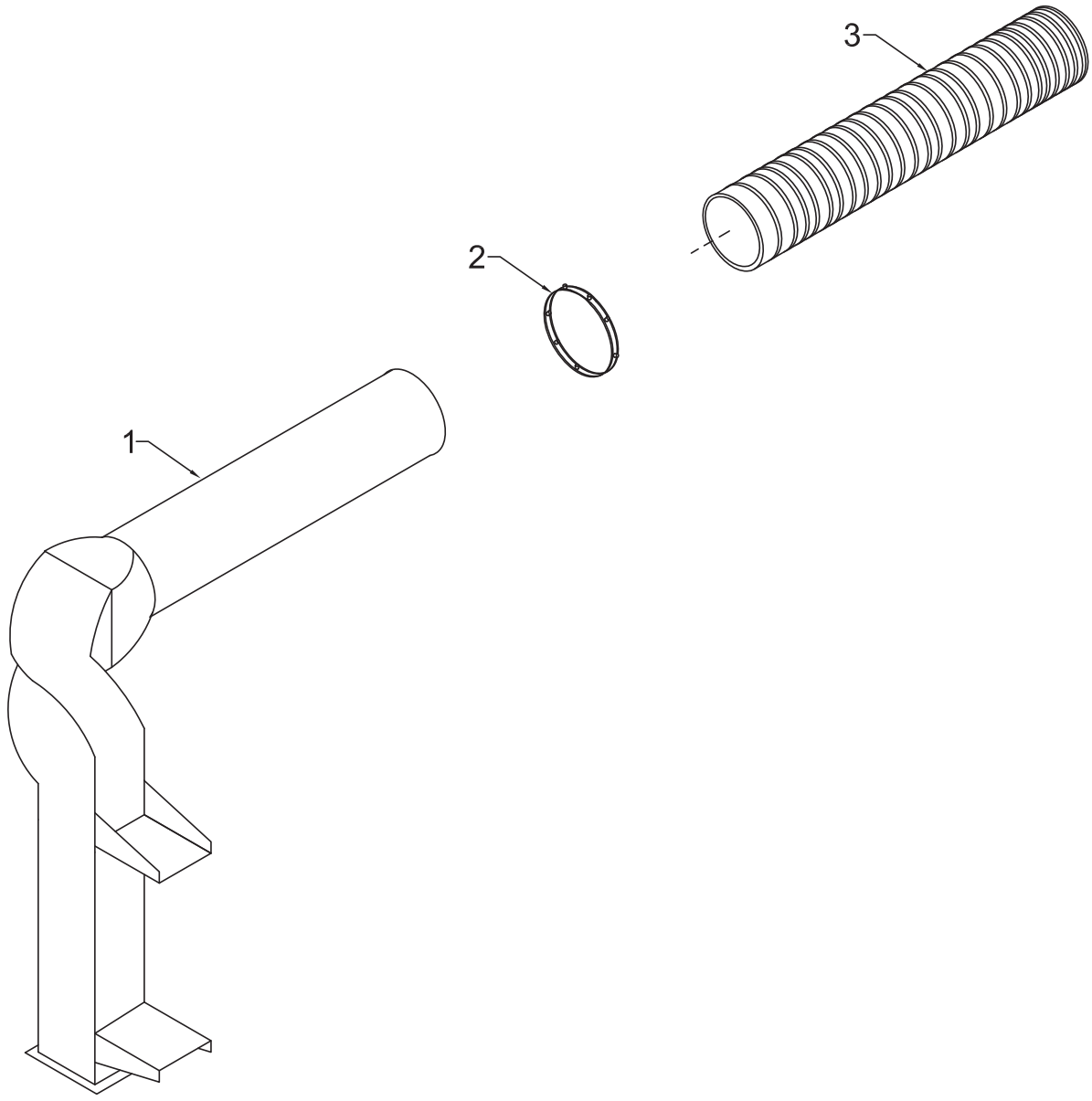
# 8.1 Blower Housing Group




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1 | 6600.10179 | Blower Housing Back |
| 2 | 6600.70832 | Liner Set |
| 3 | GV21520.TL | Impeller |
| 4 | LCT650.601 | Bushing |
| 5 | LCT650.601.K | Key |
| 6 | LCT60.652 | Shaft Protector |
| 7 | 5CZ.500.750 | Bolt |
| 8 | 6600.34059 | Intake Elbow |
| 9 | 6410.51 | Limit Switch |
| 10 | | Limit Switch Bracket |
| 11 | 6600.618.18 | Clamp |

# 8.2 Exhaust Duct Assembly




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1 | 6600.24624 | Exhaust Elbow |
| 2 | 6600.34049 | Ring |
| 3 | 6600.34026 | Metal Flex Hose |

# 9-0

## 9.0 TRAILER GROUP

- 9.1 Trailer Bed Group
- 9.2 Fuel Tank Group
- 9.3 Tongue Group
- 9.4 Hydraulic Parking Jack - OPTIONAL
- 9.4 Axle Hub Assembly
- 9.5 Brake Assembly

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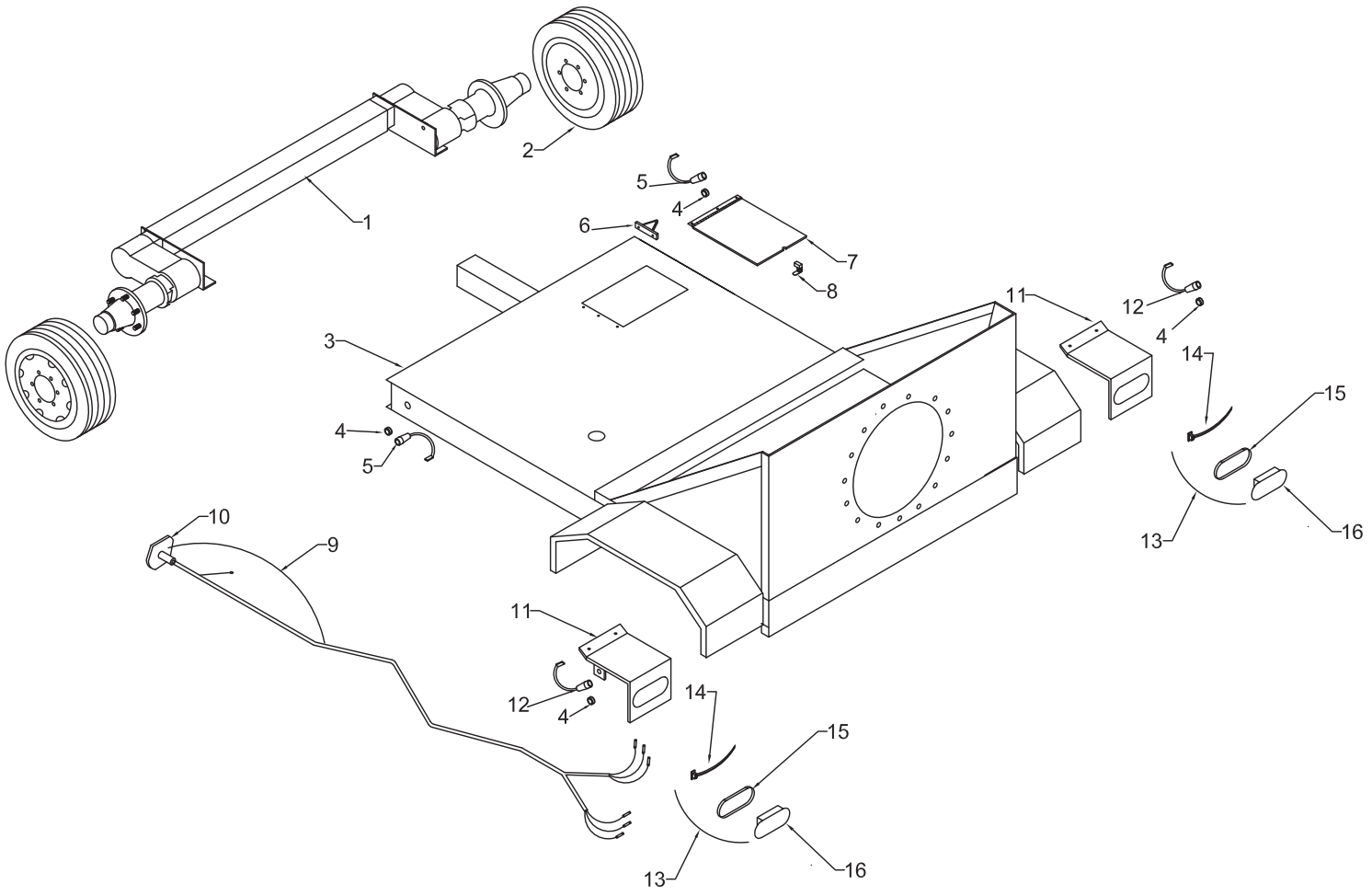
# 9.1 Trailer Bed Group

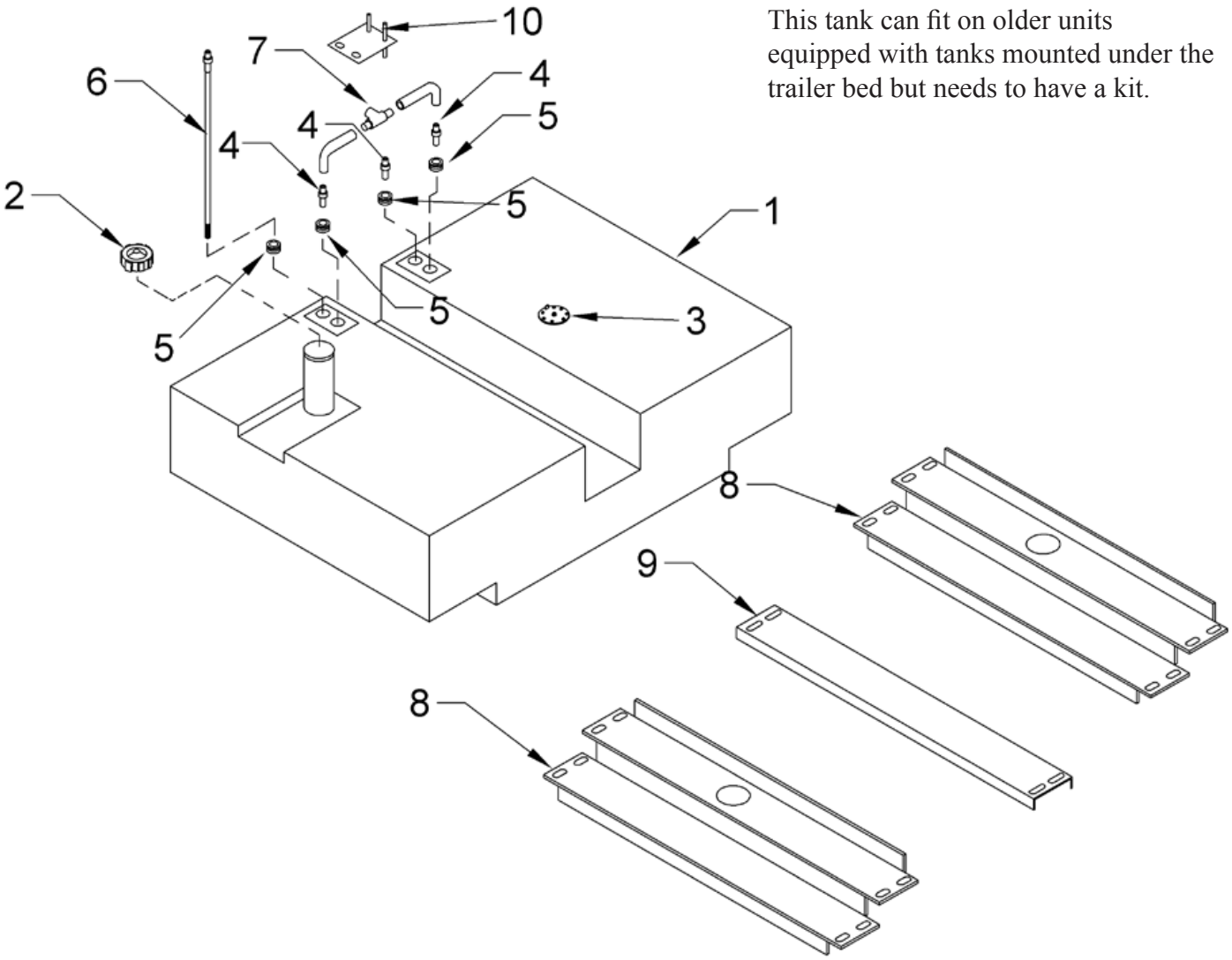



| ITEM # | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | LCT622.614TE | Axle Assembly |
| 2 | LCT622.618.08 | Tire and Rim Assembly |
| 3 | 6600.1000 | Trailer Bed |
| 4 | STD.2202G | Grommett |
| 5 | STD.2202 | Marker Light, Yellow |
| 6 | | Hose Lock Bracket |
| 7 | LCT622.602 | Battery Door |
| 8 | LCT622.602.L | Battery Door Latch |

| ITEM # | PART NO. | DESCRIPTION |
|---|---|---|
| 9 | LCT622.626 | Trailer Harness |
| 10 | OD100002 | Trailer Plug |
| 11 | 6600.1002 | Light Bracket |
| 12 | STD.2201 | Marker Light, Red |
| 13 | STD.2214 | Tail Light Assembly |
| 14 | OD94706 | Plug |
| 15 | OD60700 | Grommett |
| 16 | OD60250R | LED Light |

# 9.2 Fuel Tank Group

April 2007 and after

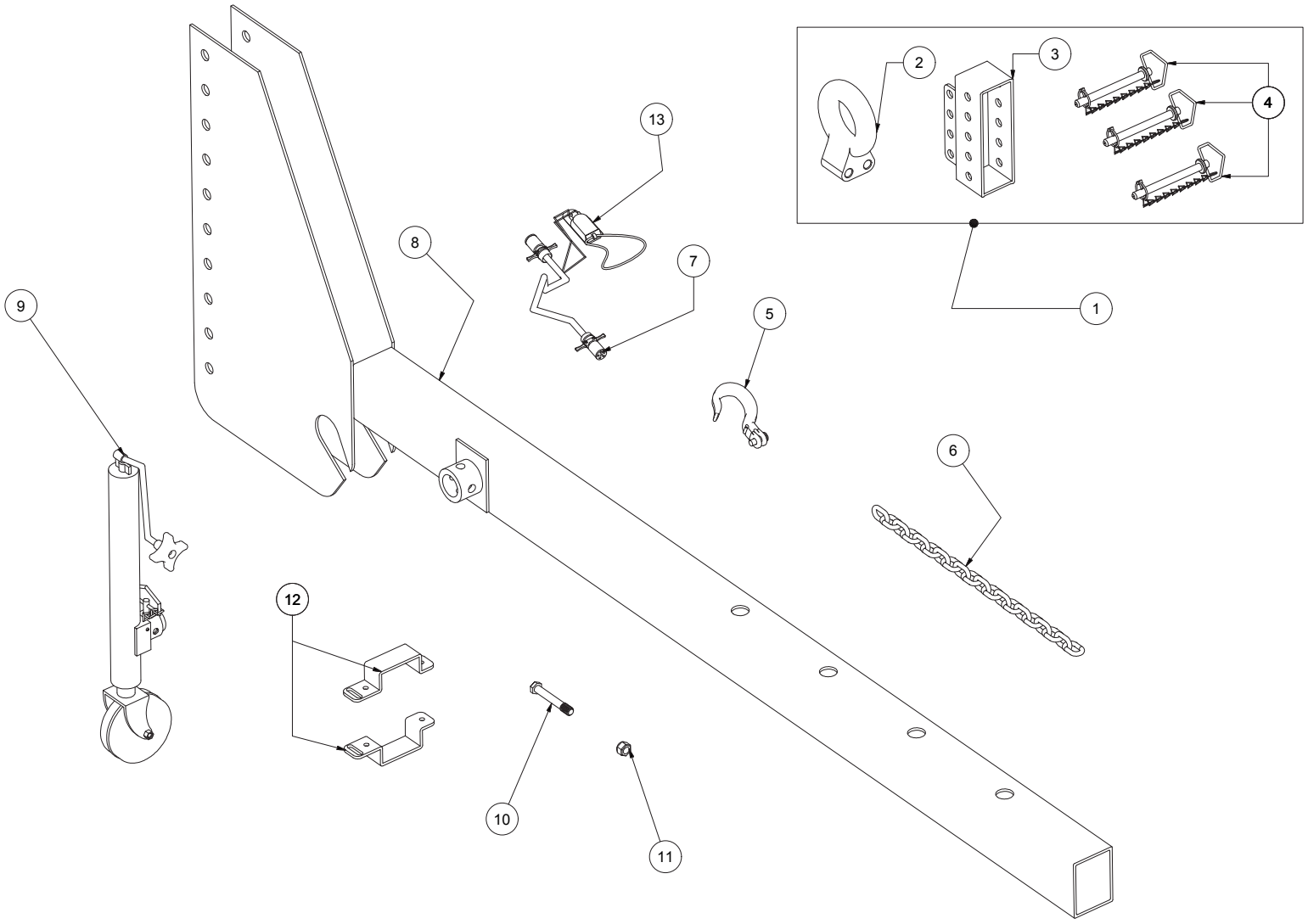



This tank can fit on older units equipped with tanks mounted under the trailer bed but needs to have a kit.

| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1 | 600.2520 | Fuel Tank |
| 2 | 600.2521 | Fuel Cap |
| 3 | 600.2525 | Fuel Sender |
| 4 | MET633.901 | Fuel Fitting (not for pickup) |
| 5 | MET633.901M | Fuel Fitting Grommett |
| 6 | 600.2527 | Fuel Fitting, pickup tube and screen |
| 7 | 600.2526 | Tee Fitting |
| 8 | 600.2523 | Side Support Bracket |
| 9 | 600.2522 | Center Support Bracket |
| 10 | 400016 | Fuel Line Bracket (mounts on engine rail) |

# 9.3 Tongue Group

LCT600

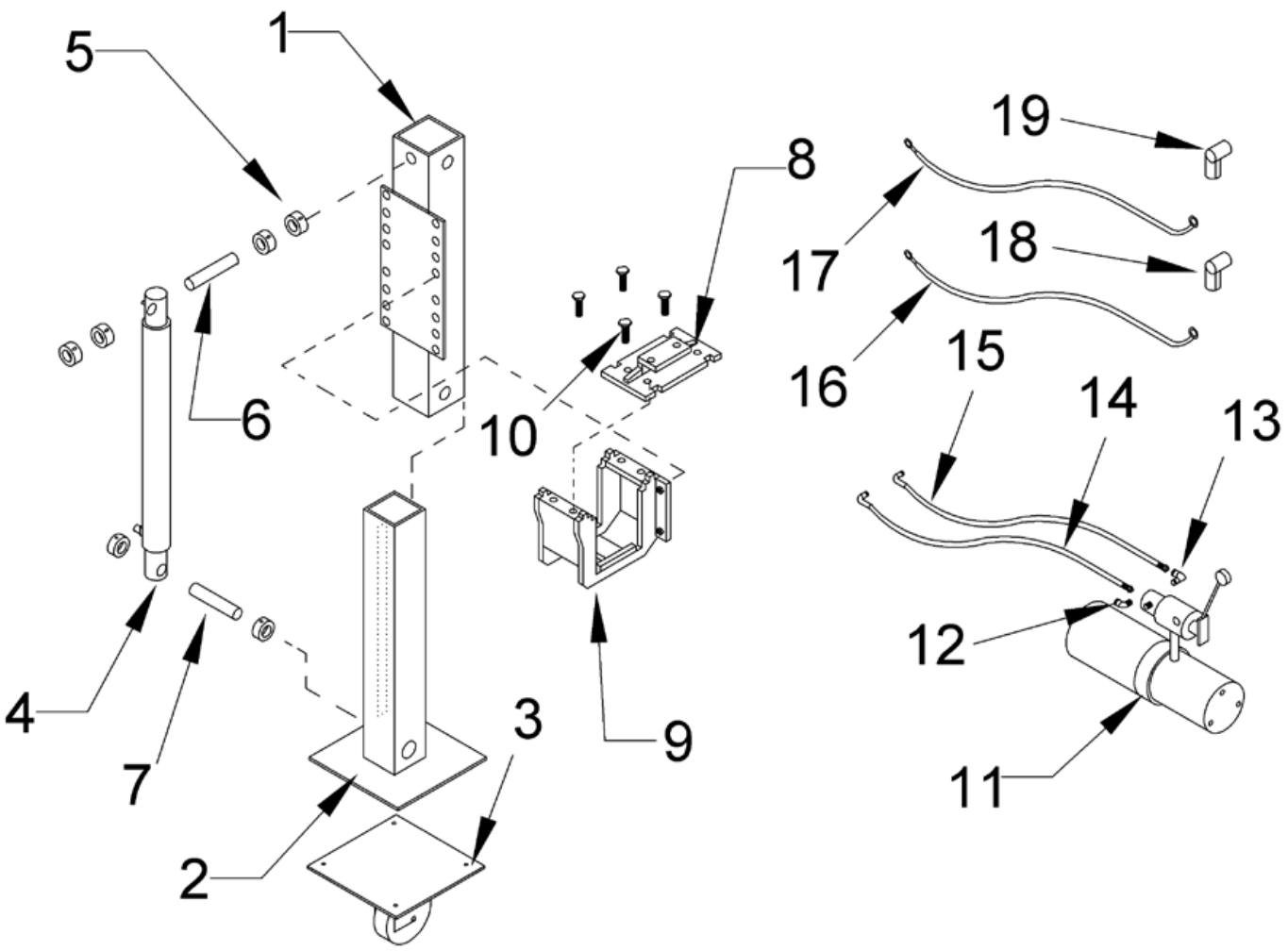



| ITEM # | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | LCT622.623D | Pintle Eye Assembly |
| | consists of | |
| 2 | LCT622.623 | Pintle Eye Ring |
| 3 | LCT622.623A.2 | Bracket w/ U-Channel |
| 4 | 200012 | Pintle Eye Pins |
| 5 | 200009 | Safety Hook, 3/8" |
| 6 | LCT600.201 | Safety Chain |

| ITEM # | PART NO. | DESCRIPTION |
|---|---|---|
| 7 | LCT622.626 | Power Cord,#13 incl. |
| 8 | 6600.1001 | Tow Bar |
| 9 | LCT622.624 | Parking Jack |
| 12 | LCT622.635A<br>LCT622.635B | Hose Lock Brkt,600<br>Hose Lock Brkt,6000 |
| 13 | 89102 | Breakaway Switch, included in #7 |

# 9.4 Hydraulic Parking Jack - OPTIONAL

LCT60C/ 600 / 6000 / 650 - optional - Nov. 2006 and after



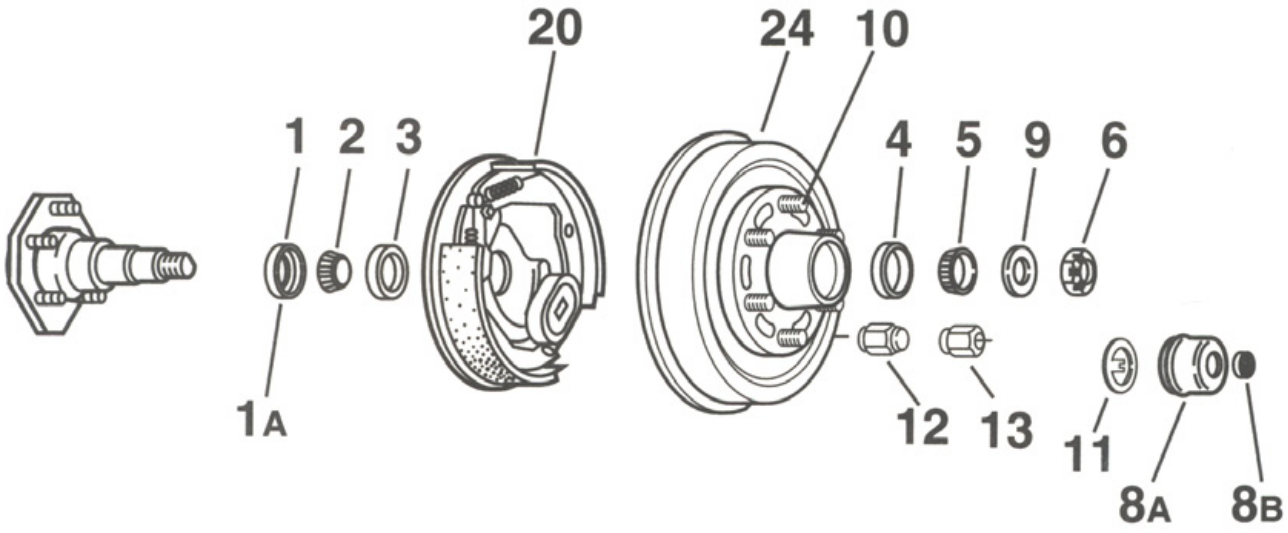

| ITEM# | PART NO. | DESCRIPTION |
|---|---|---|
| * | LCT622.624H1 | Hyd. Parking Jack Assembly incl. all below except#1-10 |
| * | LCT622.624H2 | Hyd. Parking Jack Assembly complete (includes 1-19) |
| 1 | STD.9001 | Outer Tube |
| 2 | STD.9002 | Inner Tube |
| 3 | STD.9003 | Caster Assembly |
| 4 | STD.9014 | Cylinder |
| 5 | STD.9006 | Lock Collars |
| 6 | STD.9004 | Top Pin |
| 7 | STD.9005 | Bottom Pin |
| 8 | | Outer Tube Top |
| 9 | STD.9008* | Clamp Top |
| 10 | STD.9007<br>6000.9007 | Clamp Bottom, 600/800/650<br>Clamp Bottom, 6000 |

| ITEM# | PART NO. | DESCRIPTION |
|---|---|---|
| 11 | 5CZ.500.1.5 | Clamp Bolts |
| 12 | 80.1550 | Hydraulic Pump |
| 13 | 80.1552 | Fitting, 90 degree |
| 14 | 80.1552 | Fitting, 90 degree |
| 15 | STD.9009<br>STD.9009B | Hydraulic Hose, Top<br>Hydraulic Hose, Top 2/3X |
| 16 | STD.9010<br>STD.9010B | Hydraulic Hose, Bottom<br>Hydraulic Hose, Bttm 2/3x |
| 17 | STD.9012 | Battery Cable, Red |
| 18 | STD.9013 | Battery Cable, Black |
| 19 | 65.1306 | Stud Cover, Red |
| 20 | 65.1307 | Stud Cover, Black |

Notes: *#8,9 not used on 2/3 axis units
* #11-13,16-19 not used on 2/3 axis units
* will wok on older units(use LCT622.624H2)

# 9.4 Axle Hub Assembly

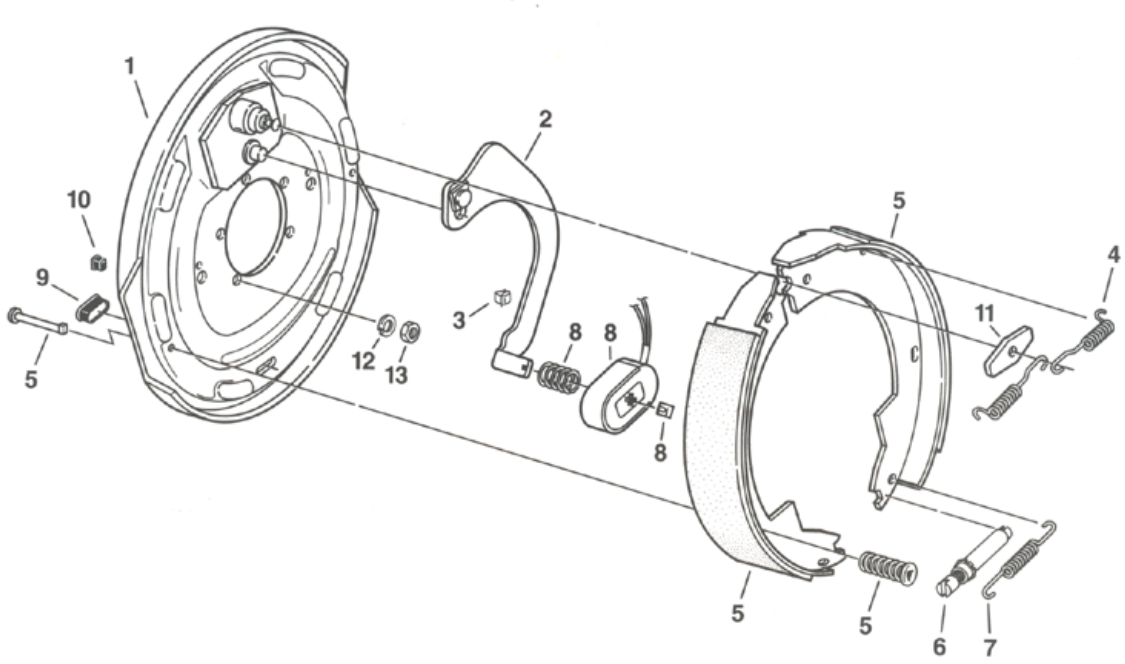
LCT60C/600/650/6000




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1 | 10.10 | Grease Seal |
| 2 | 31.30.2 | Inner Bearing Cone |
| 3 | 31.30.1 | Inner Bearing Cup |
| 4 | 31.32.1 | Outer Bearing Cup |
| 5 | 31.32.2 | Outer Cone |
| 6 | 006.001.00 | Spindle Nut |
| 7 | N/A | N/A |
| 8A | 021.042.01 | Grease Cap |
| 8B | 085.001.00 | Rubber Plug |
| 9 | 005.023.00 | Spindle Washer |
| 10 | 7.122 | Wheel Stud, 1/2-20 |
| 11 | 005.101.00 | Tang Washer |
| 12 | 006.080.00 | Lug Nut, 1/2-20 |
| 20 | K23.105<br>K23.106 | Electric Brake Assembly, LH<br>Electric Brake Assembly, RH |
| 24 | 008.201.05 | Grease Hub and Drum |

# 9.5 Brake Assembly

LCT60C/600/650/6000




| ITEM NO. | PART NUMBER | DESCRIPTION |
|---|---|---|
| 0. | K23.105 | LH Complete Brake Assembly |
| 0. | K23.106 | RH Complete Brake Assembly |
| 1. | 36.89.5 | Backing Plate Assembly |
| 2. | 047.107.00 | Actuating Lever Arm Assembly LH |
| | 047.108.00 | Actuating Lever Arm Assembly RH |
| 3. | 027.005.00 | Wire Clip |
| 4. | 046.009.00 | Rectractor Spring |
| 5. | K71.048.00 | Shoe and Lining Kit |
| 6. | 043.004.00 | Adjuster Assembly |
| 7. | 046.018.00 | Adjusting Screw Spring |
| 8. | K71.105.00 | Magnet Kit containing: |
| | 042.099.01 | (1) Magnet |
| | 027.099.00 | (1) Magnet Clip |
| | 046.080.00 | (1) Magnet Spring |
| 9. | 046.007.00 | Plug |
| 10. | 046.016.00 | Wire Grommet |
| 11. | 005.067.00 | Anchor Post Washer |
| 12. | 005.004.00 | Lockwasher |
| 13. | 006.010.00 | Brake Mounting Nut |

# 10-0

## HOSE BOOM GROUP

- 10.1 Boom Group
- 10.2 Intake Hose Group
- 10.3 M3219 Hydraulic Boom Pump



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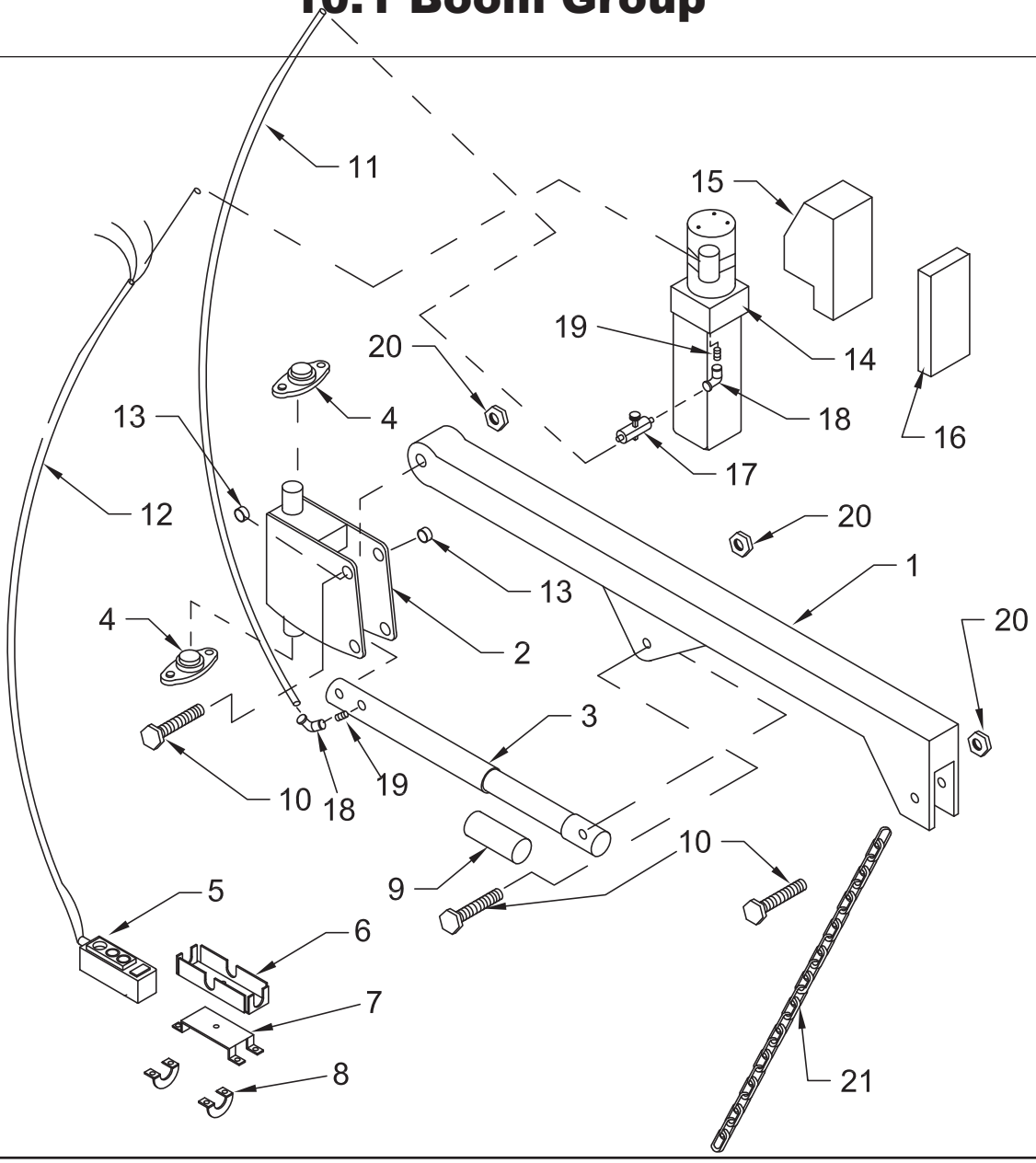
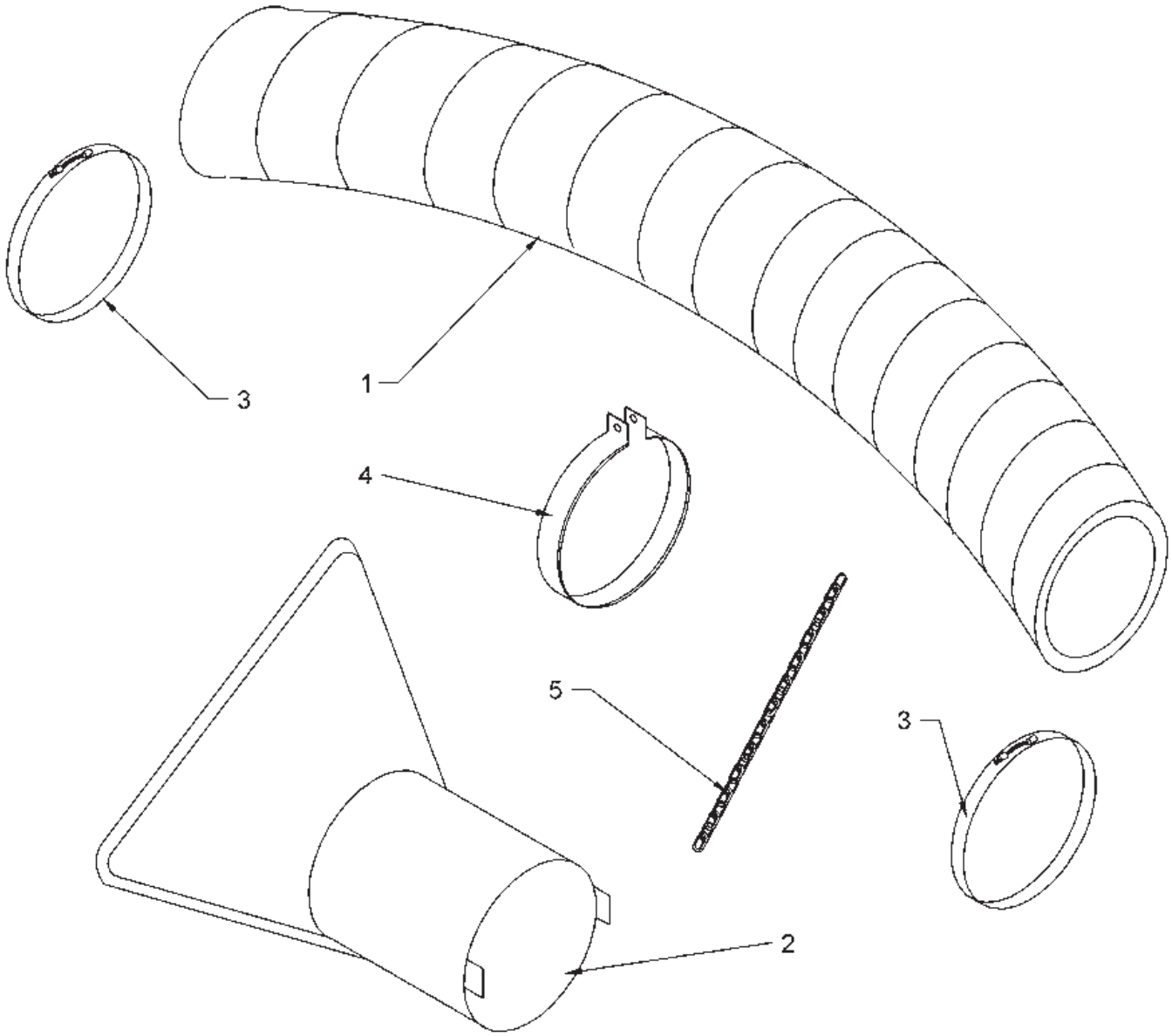
# 10.1 Boom Group




| ITEM # | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | LCT616.606A | Boom Arm |
| 2 | 6600.40132 | Boom Mast |
| 3 | MP-CS.150.12 | Boom Cylinder |
| 4 | LCT616.801 | Boom Mast Bearings |
| 5 | STD.2350 | Up/Down Switch Assy |
| 6 | STD.2352 | Switch Holder |
| 7 | STD.2353 | Switch Bracket |
| 8 | LCT616.615D | Hold Down Bracket |
| 9 | | Spacer |
| 10 | 200011 | Pin |
| 11 | 6600.61052 | Hydraulic Hose |

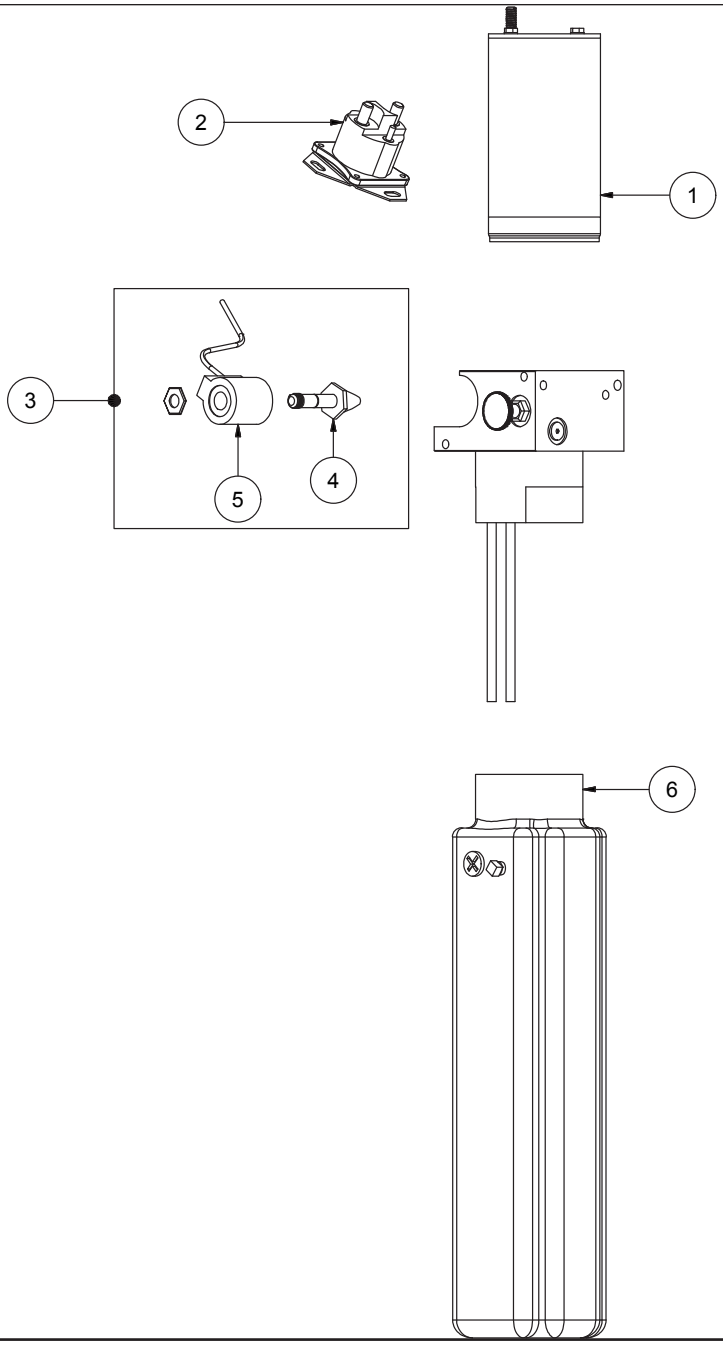
| ITEM # | PART NO. | DESCRIPTION |
|---|---|---|
| 12 | N/A | Harness, with #5 |
| 13 | RMB531 | Bushing |
| 14 | M3219.S | Hydraulic Pump |
| 15 | LCT617.608 | Pump Cover |
| 16 | 200022 | Pump Spacer |
| 17 | N/A | N/A |
| 18 | 9405.4.4 | 90 Degree Fitting |
| 19 | 9205.4.4 | Straight Fitting |
| 20 | ZENC.625 | Nut |
| 21 | LCT60.642 | Chain |

# 10.2 Intake Hose Group




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| 1 | LC-MDH.16.120<br>LC-SDH.16.120.UC<br>LC-MDH.16.100 | Intake Hose, except SCL<br>Intake Hose, Urethane (multi-axis)<br>Intake Hose, SCL800 |
| 2 | LCT616.601 | Intake Nozzle |
| 3 | LCT616.616 | Hose Clamp, Bolt Style |
| 4 | LCT616.603U<br>LCT616.603U.B | Hose Clamp, 3/8" thick hoses<br>Hose Clamp, urethane hoses |
| 5 | LCT60.642 | Support Chain |

# 10.3 M3219 Hydraulic Boom Pump




| ITEM # | PART NUMBER | DESCRIPTION |
|---|---|---|
| | MP-M3219.S | Complete Pump Assembly (all above) |
| 1 | MP-08004 | Electric Motor, 12V |
| 2 | MP-17744 | Solenoid Switch, heavy duty |
| 3 | MP-19283.D | Coil, Cartridge Assembly |
| 4 | MP-07193.D | Cartridge |
| 5 | MP-10861.D | Coil, 2 way - 2 position |
| 6 | MP-06232 | Plastic Reservoir, 3.5" x 15.7" |

**⚠WARNING** **Read and understand this entire manual before operating, maintaining or repairing the leaf vacuum.**

**⚠ DANGER**

**DO NOT RIDE, SIT OR STAND ON UNIT.**

**RIDING ON UNIT COULD RESULT IN BODILY HARM OR FATAL INJURY USE EXTREME CAUTION WHEN UNIT IS IN USE, OR IN MOTION.**

If the decal above is missing or damaged call GVM-Vac immediately and we will send you a replacement free of charge. Never operate a unit with damaged or missing safety decals.

**⚠ DANGER** **DO NOT RIDE, SIT OR STAND ON UNIT**

**⚠ DANGER** **DO NOT MODIFY THE UNIT FOR RIDERS IN ANY WAY. SERIOUS INJURY OR DEATH MAY OCCUR**

GVM-Vac's leaf collectors are NEVER to be used to accomodate riders. If your unit has been modified to accomdate riders, remove these modifications immediately as this can result in serious injury or death.

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# ⚠ CAUTION

# DO NOT ATTEMPT TO OPERATE OR REPAIR THE LEAF COLLECTOR WITHOUT FIRST READING AND UNDERSTANDING THIS MANUAL

IF YOU HAVE ANY QUESTIONS CONCERNING THE INSTALLATION OR OPERATION OF THIS UNIT, PLEASE CALL GVM-Vac FOR ASSISTANCE BEFORE ATTEMPTING TO REPAIR OR OPERATE THE UNIT.

# IMPROPER USE OF ANY MACHINE CAN RESULT IN SERIOUS INJURY!

# STUDY AND FOLLOW ALL SAFETY PRECAUTIONS BEFORE OPERATING OR REPAIRING UNIT

THIS MANUAL IS AN INTEGRAL PART OF THE LEAF COLLECTOR AND SHOULD BE KEPT WITH THE UNIT WHEN IT IS SOLD.

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